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THE

JOURNAL OF BOTANY;

CONTAINING

FIGURES AND DESCRIPTIONS

OF

SUCH PLANTS AS RECOMMEND THEMSELVES BY THEIR NOVELTY, RARITY, HISTORY, OR USES;

TOGETHER WITH

BOTANICAL NOTICES AND INFORMATION,

AND

OCCASIONAL PORTRAITS AND MEMOIRS OF DECEASED BOTANISTS;

BY

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JOURNAL OF BOTANY.

I.—Musci Indici; *or List of* Mosses *collected in the East Indies by Dr Wallich; with references to the Figures of the new Species published in Hooker's Icones Plantarum, vol.* I. *tabs.* XVII—XXIV; *by the* Honorable W. H. Harvey: *to which are added those collected by Dr Royle in the northern part of India, by* J. D. Hooker, M.D., Assistant-Surgeon and Botanist in Her Majesty's Discovery Ship Erebus.

A * placed before a species, implies that it is in the collections of both Dr Wallich and Dr Royle;—† denotes that it is contained in Dr Royle's collection only.

* 1. Gymnostomum *xanthocarpum. Hook. Musc. Ex. t.* 153. —*Wall. Cat. n.* 7546.

Hab. Nepal and Himala.—Dr Royle's collection contains 3 very distinct varieties of this plant, only one of which, the *var. γ.*, exists in Dr Wallich's; they are the following:— † *α.* Stems long, leaves narrow, capsule cylindrical.—† *β.* Stems short, leaves secund broad, capsules elliptical.—*γ.* Stems long, leaves narrow, capsule globose.

2. G. *pyriforme. Hedwig, Sp. Musc.* I. *p.* 27.—Hab. Nepal.

3. G. *rufescens. Schwaeg. Suppl. t.* 206. *Wall. Cat. n.* 7547. *Hook. Icon. Plant. t.* XVII. fig. 3. a, *plants, nat. size*; b, *leaf*; c, *section of do., showing the recurved margin*; d. *capsule, with annulus partly removed*; e, *operculum*:—*magnified.*—Hab. Nepal.

* 4. G. *involutum. Hook. Musc. Ex. t.* 154.—*Wall. Cat. n.* 7545.

Hab. Nepal and Himala.—The apices of the leaves appear usually to be serrulate, a character which has been overlooked

in the figure and description given in the *Musc. Exot.*—In general aspect, this plant much resembles the *Tortula angustifolia, Hook. et Grev.;* but the stems are longer, the setæ shorter, and the leaves are broader and slightly serrate.

5. G. *cylindricum* (*Hook. in Wall. Cat. n.* 7548); caule elongato, foliis late oblongis obtusis submucronulatis undulatis margine involutis apice serrulatis, capsula cylindracea, operculo subulato.—*Hook. Ic. Plant. t.* XVII. *fig.* 2. a, *plants, nat. size;* b, *upper leaf;* c, *lower leaf;* d, *point of leaf;* e, *capsule:—magnified.*

Hab. Prome.—*Stems* densely tufted. *Leaves* dull green, the upper ones much larger than the lower, and of a more elliptic shape, slightly involute when moist, strongly so and crisped when dry, minutely serrulate at the point. *Capsules* abundantly produced, pale brown. *Seta* yellow.—Nearly related to *Gymnostomum involutum*, from which it differs more in general appearance than by any evident characters.

6. G. *spathulatum* (*Harv.*)*;* caule brevi, foliis involutis obovato-spathulatis obtusis integerrimis, capsula cylindracea, operculo subulato.—*Hook. Ic. Plant. t.* XVII. *fig.* 1. a, *nat. size;* b, *leaves;* c, *point of leaf;* d, *capsule:—magnified.*

Hab. Nepal.—A smaller plant than either of the two preceding, and sufficiently characterized by the shape of its leaves, much smaller capsule, and shorter seta.

7. G. *vernicosum* (*Hook. in Wall. Cat. n.* 7549); caule brevi subramoso, foliis pellucidis caulinis ovato-oblongis obtusis integerrimis seminerviis, ramorum subrotundatis, capsula ovata erecta nitidissima, operculo longe rostrato.—*Hook. Ic. Plant. t.* XVII. *fig.* 4. a, *nat. size;* b, *leaf of the stem;* c, c, *leaves of the innovations;* d, *capsule;* e, *operculum:—magnified.*

Hab. Prome.—Spreading in wide dense patches of a dark-green colour. *Stems* short, branched with innovations. *Leaves,* of the fertile stems, ovate, obtuse, of the innovations roundish or obovate, very blunt. *Capsules* abundant, dark glossy-brown.—Well distinguished by its very blunt pellucid leaves, and shining brown capsules.

8. Lyellia *crispa. Br. in Linn. Tr. v.* 12. *p.* 562. *Hook. Musc. Ex. t.* 161. *Wall. Cat. n.* 7550.—HAB. Nepal.

* 9. Polytrichum *aloides. Hedw. St. Crypt. v.* 1. *t.* 14. *Wall. Cat. n.* 7551.—HAB. Nepal and Himala.

* 10. P. *urnigerum. Hedw. Sp. Musc. t.* XXII. *Wall. Cat. n.* 7552.—HAB. Nepal and Himala.

* 11. P. *microstomum. Brown.—Schw. Suppl. t.* 154. *Wall. Cat. n.* 7553, and P. juniperinum, *Wall. Cat. n.* 7554.

HAB. Nepal and Himala.—This species appears too nearly allied to P. *urnigerum* to be considered specifically distinct.

12. P. *contortum. Schw. Suppl. t.* 96. *Wall. Cat. n.* 7557.—HAB. Nepal and Sylhet.

13. P. *patulum (Harv.);* caule simplici, foliis distantibus lanceolatis serratis planis siccitate strictis patentibusque, capsula brevi subturbinata erecta, operculo rostrato. *Hook. Ic. Plant. t.* XVIII. *fig.* 1. a, *plants, nat. size;* b, *leaf;* c, *point of ditto;* d, *capsule:—magnified.*

HAB. Nepal.—*Stems* 1-3 inches high, simple, slender, often naked below. *Leaves* laxly set, spreading when dry. *Nerve* strong and well defined.

* 14. P. *undulatum. Hedw. Musc. Frond. t.* XVI. and XVII.—γ. subserratum.—*Wall. Cat. n.* 7556; foliis subintegerrimis, apicem versus serratis.—HAB. Nepal and Himala.

† 15. P. *semilamellatum (Hook. fil.);* caule brevi simpliciusculo, foliis lanceolatis concavis integerrimis subcoriaceis laxe imbricatis siccitate contortis, nervo superne latiore lamellato, lamellis undulatis, seta caulibus longiore, capsula inclinata subcylindracea, operculo longirostrato.—*Hook. Ic. Pl. t* CXCIV. A. *fig.* 1. *plants, nat. size; f.* 2. *single plant; f.* 3, 4. *leaves:—magnified.*

HAB. Himala mountains.—Only a few specimens, and those in too young a state for a very satisfactory determination, exist in Mr Royle's collection. It may, however, be readily distinguished at first sight, by the relative size of its foliage, which is smaller than in any of its congeners.

16. Tortula *flavescens. Hook. et Arn. in Edin. Journal, v.* I. *p.* 297. *t.* 12.—T. *fuscescens. Wall. Cat. n.* 7567.—Hab. Nepal.

17. T. *Indica. Hook. Musc. Ex. t.* 135. *Wall. Cat. p.* 7565. Hab. Walls of the Calcutta Botanic Garden.

18. T. *angustifolia. Hook. et Grev. l. c. Wall. Cat. n.* 7566. Hab. Nepal.

19. T. *tenuirostris. Hook. et Grev. l. c. Wall. Cat. n.* 7568. Hab. Nepal.

20. Trichostomum *subsecundum* (Hook. et Grev. mss.); caule elongato ramoso, foliis secundis ovatis acuminatis integerrimis margine reflexo apice diaphanis, nervo excurrente, capsula erecta oblongo-ovata.—*Hook. Ic. Plant. t.* XVII. *fig.* 5. a, *plant, nat. size;* b, *leaf;* c, *point of ditto;* d, *capsule, with operculum removed;* e, *portion of the peristome:—magnified.*—Hab. Nepal.

21. Didymodon? *Tortula, Harv.;* foliis subsecundis ovato-lanceolatis serratis marginibus reflexis siccitate crispatis contortis, capsula oblonga erecta, (peristomii dentibus subtorquatis).—*Hook. Ic. Plant. t.* XVIII. *fig.* 2. a, *plant, nat. size;* b, *leaf;* c, *capsule;* d, *occasional appearance of peristome;* e, *portion of peristome:—magnified.*

Hab. Nepal.—We are doubtful to what genus this ought, with most propriety, to be referred. The long slender teeth of the peristome, which are often slightly twisted in a spiral direction, indicate a close affinity with *Tortula;* while the foliage and habit of the plant agree better with *Didymodon* or *Trichostomum.*—Our specimens do not possess either calyptra or operculum.

22. D. *sphagnoides. Schw. Suppl. t.* 182.—(Syrrhopodon candidus.) *Wall. Cat. n.* 7572.—Hab. Singapur.

* 23. D. *purpureum. Hook. et Tayl. Musc. Brit. t.* XX. *Wall. Cat. n.* 7573.—Hab. Nepal and Himala.

24. D. *squarrosum. Hook. Musc. Ex. t.* 150;—*Wall. Cat. n.* 7570.—Hab. Nepal and Kamoon.

25. D. *vaginatum* (*Hook. in Wall. Cat. n.* 7571); foliis subulatis, falcato-secundis siccitate crispatis involutis vaginatis, vagina latissima oblonga, capsula cylindracea, operculo rostrato.—*Hook. Ic. Plant. t.* XVIII. *fig.* 4. a, *nat. size;* b, b, *leaves;* c, *capsule;* d, *portion of peristome:—magnified.*

HAB. Nepal.—2-3 inches high. *Leaves* variously twisted when dry, distant, patent, their long *sheaths* clasping the stem. Teeth of the *peristome* combined at the base.

26. D. *cirrhifolium* (*Harv.*); foliis longissimis subulatis flexuosis patentibus siccitate crispatis basi vaginatis, vagina ovata, capsula oblonga, operculo conico-acuminato.—*Hook. Ic. Plant. t.* XVIII. *fig.* 5. a, *nat. size;* b, b, *leaves;* c, *capsule;* d, *portion of peristome:—magnified.*

HAB. Nepal.—Nearly allied to D. *capillaceum*, but easily distinguished by the much crisped and curled leaves when dry.

† 27. Grimmia *laxifolia* (*Hook. fil.*); caulibus elongatis cæspitosis, foliis mollibus lurido-virescentibus oblongo-lanceolatis carinatis integerrimis acutis siccitate crispis, seta elongata, capsula elliptica oblonga brevi.—*Hook. Ic. Plant. t.* CXCIV. B. *fig.* 1. *plant, nat. size; f.* 2. *plant, magnified; f.* 3, 4. *leaves; f.* 5. *capsule laid open, showing the columella:—magnified.*

HAB. Himala mountains.—Very dissimilar in general appearance from any known species of *Grimmia*, although a careful examination of the peristome has induced us to refer it to that genus.—*Stems* very lax, somewhat branched. *Leaves* flaccid and laxly set. *Setæ* springing from short lateral shoots. *Capsules* red-brown, with large, angular reticulations. *Teeth* short, yellow above, red beneath. *Columella* large, subclavate.

28. Dicranum *bryoides*. *Swartz.*—*Fissidens, Hedw. Sp. Musc.* I. *p.* 164. *Wall. Cat. n.* 7580.—HAB. Nepal.

29. D. *taxifolium*. *Swartz.*—*Fissidens, Hedw. Sp. Musc. t.* XXXIX. *f.* 1-5. *Wall. Cat. n.* 7581.—HAB. Nepal.

30. D. *polypodioides*. *Hedw. St. Crypt.* III. *t.* 27. *Fissidens, Wall. Cat. n.* 7582.—HAB. Nepal.

31. D. *glaucum. Hedw.—Musc. Brit. t.* XXI. *Wall. Cat. n.* 7578.—Hab. Nepal.

32. D. *megalophyllum. Raddi.—Wall. Cat. n.* 7579.—*Sphagnum, Brid.*—Hab. Singapur, Nepal.

33. D. *phascoides. Hook. Bot. Misc. vol.* 1. *t.* 21.—Hab. Sylhet.

34. D. *fragile. Hook. Musc. Ex. t.* 134. *Wall. Cat. n.* 7576. —Hab. Nepal.

35. D. *scoparium. Hedw.—Musc. Brit. t.* XVIII. *Wall. Cat. n.* 7574.—Hab. Nepal.

36. D. *dicarpon. Brown.—Schw. Suppl. t.* 251.

Hab. Nepal.—Our specimens well agree with Schwaegrichen's characters, but the leaves are more dense than represented in his figure.

37. Thysanomitrion *flexuosum. Hedw. Musc. t.* XXXVIII. *f.* 1-6. (Dicran. flexuosum.)—*Wall. Cat. n.* 7575.—Hab. Nepal.

38. T. *uncinatum* (*Harv.*); caule elongato, foliis longissimis subulatis falcato-secundis, capsula erecta ovata lævi, operculo rostrato.—*Hook. Ic. Plant. t.* XXII. *fig.* 5. a, *nat. size;* b, *leaf;* c, *capsule;* d, *tooth of peristome:—magnified.*

Hab. Nepal.—2-3 inches high, robust. *Leaves* very long, setaceo-subulate, falcato-secund, with a very broad nerve, and a narrow, somewhat sheathing base. *Seta* spirally twisted. *Teeth* of the *peristome* 16, cleft nearly to the base.

39. Weissia *flaccida* (*Harv.*); cæspitosa, caule brevi ramoso, foliis flaccidis reticulatis ovatis obtusis patentibus, nervo attingente, capsula erecta ovata.—*Hook. Ic. Plant. t.* XVIII. *fig.* 3. a, *nat. size;* b, *lower leaf;* c, *upper leaf;* d, *capsule;* e, *portion of peristome:—magnified.*

Hab. Nepal.—Tufted, half an inch high, full-green. *Stems* weak, branched with innovations. *Leaves* very flaccid, thin and pellucid.—We have neither seen an operculum nor a perfect peristome; on one or two capsules we find a few short teeth, mixed with broken ones, which appear to be those of a *Weissia.*

40. Trematodon *ambiguus. Wall. Cat. n.* 7583.—(Dicranum.)—*Hedw. Musc. Frond. t.* XXXVI.—HAB. Nepal, and mountains of Ava.

41. Octoblepharum *albidum. Hedw. Musc. Frond. t.* VI.—*Wall. Cat. n.* 7563.—HAB. Singapur, &c.

42. Orthodon *serratus. Brid. Musc. Suppl.* 1. *p.* 86. *Wall. Cat. n.* 7564.—Octoblepharum, *Hook. in Trans. Linn. Soc.* IX. *t.* XXVI. *f.* 2.—HAB. Nepal.

43. Zygodon *obtusifolius. Hook. Musc. Ex. t.* 159. *Wall. Cat. n.* 7568.—HAB. Nepal.

44. Schlotheimia *sulcata. Hook. Musc. Ex. t.* 156.—*Wall. Cat. n.* 7586.—HAB. Nepal.

45. Orthotrichum *Nepalense. Hook. et Grev. in Edin. Journal, v.* I. *p.* 117. *t.* IV. *Wall. Cat. n.* 7585.—HAB. Nepal.

46. O. *Moorcroftii. Hook. et Grev. l. c. Wall. Cat. n.* 7584.—HAB. Nepal.

47. Syrrhopodon *Gardneri. Hook. et Grev. l. c.;* (Calymperes). *Wall. Cat. n.* 7558.—HAB. Nepal.

48. S. *Taylori. Schw.;—Hook. et Grev. l. c.—Wall. Cat. n.* 7560.—HAB. Nepal.

49. S. *spiculosus. Hook. et Grev. l. c.;—Wall. Cat. n.* 7561.—HAB. Singapur.

50. S. *rufescens. Hook. et Grev. l. c.—Wall. Cat. n.* 7559.—HAB. Penang.

51. S. *fasciculatus. Hook. et Grev. l. c.—Wall. Cat. n.* 7562.—HAB. Singapur.

52. S. *repens (Harv.);* caule repente effuso, ramis erectis brevibus, foliis oblongis undulatis obtusis mucronulatis marginatis serratis, apice integerrimis. *Hook. Ic. Plant. t.* XXII. *fig.* 4. a, a, *leaves magnified;* b, *base of a leaf to show the pellucid cellules:—magnified.*

Hab. Penang; on the bark of trees, over which it creeps in wide patches.—Upright, branches very short, densely crowded, fastigiate, thickly clothed with leaves which are spirally twisted when dry. *Leaves* oblong, elliptical, ciliato-dentate, with pellucid bases and a distinct margin, which is broadest in the lower part, becoming gradually narrower upwards, and terminating a short way beneath the apex; apex often involute. *Nerve* running into a short mucro. *Capsule* unknown.—The structure of the leaves in this beautiful little plant is so completely similar to what occurs in the other species of *Syrrhopodon*, that we feel no hesitation, although ignorant of the fruit, in referring it to that genus.

* 53. Funaria *calvescens. Schwaegr. Suppl. t.* 65. *Wall. Cat. n.* 7606.—Hab. All over India.

* 54. Bartramia *fontana. Swartz.—Musc. Brit. t.* XXIII. *Wall. Cat. n.* 7607.—* *β. falcata.* B. falcata. *Hook. in Linn. Trans. v.* 9. *t.* 27. *Wall. Cat. n.* 7608.—Hab. Nepal.

† 55. B. *Turneriana. Schwaegr. Suppl. t.* CCXXXVIII. *Herb. Royle.*—Hab. Himala mountains.

† 56. Glyphocarpa? *Roylii* (*Hook. fil.*); foliis lanceolato-subulatis longissime acuminatis, nervo piliformi serrato excurrente, areolis oblongis, capsula depresso-globosa lævi.—*Hook. Ic. Plant. t.* CXCIV. C. *fig.* 1. *plant, nat. size; f.* 2. *ditto, magnified; f.* 3. *leaves; f.* 4. *cellules of ditto; f.* 5. *apex of a leaf; f.* 6. *capsule:—magnified.*

Hab. Himala mountains.—Well distinguished from the other species of the genus by the form of the capsule, which is globose and vertically compressed, smooth, and slightly sulcated only in age, the mouth is very small, and destitute of a peristome in the somewhat imperfect specimens we examined.

* 57. Bryum *julaceum. Schrad.—Musc. Brit. t.* XXVIII. —Hab. North of India.

* 58. B. *argenteum, Linn.—Musc. Brit. t.* XXIX. *Wall. Cat. n.* 7604.—Hab. Nepal.

* 59. B. *cæspititium, Linn.—Musc. Brit. l. c.*—Hab. North of India.

60. B. *coronatum, Schwaegr. Suppl. t.* 71. *Wall. Cat. n.* 7600.—Hab. Throughout India.

61. B. *cellulare. Hook. in Schwaegr. Suppl. t.* 214. *Wall. Cat. n.* 7601.—Hab. Nepal.

62. B. *teretiusculum* (Hook. in Wall. Cat. n. 7597); caule breviusculo ramoso, foliis subconcavis erectis ovato-lanceolatis integerrimis marginibus recurvis, nervo attingente, capsula inclinata ovata.—*Hook. Ic. Plant. t.* XX. *fig.* 1. a, *nat. size;* b, *leaf;* c, *apex of ditto;* d, *capsule:—magnified.*

Hab. Nepal.—Nearly allied to B. *turbinatum*, but different in the shape of the capsule.

63. B. *nitens* (Hook. in Wall. Cat. n. 7592); caule elongato subramoso, foliis ovatis acutis reticulatis serrulatis, nervo crasso attingente, capsula oblonga cernua, operculo conico-acuminato.—*Hook. Ic. Pl. t.* XIX. *fig.* 6. a, *plant, nat. size;* b, *leaf;* c, *portion of ditto, to show the cellules;* d, *capsule;* e, f, *portions of the outer and inner peristomes:—magnified.*

Hab. Nepal.—An inch in height, of a brilliant shining green. *Leaves* reticulated, with square cellules.

* 64. Pohlia *elongata, Hedw.—Bryum, Musc. Brit. t.* XXX. —var. *Nepalense, Hook. in Wall. Cat. n.* 7590.—Hab. Nepal.

65. P. *flexuosa* (Hook. in Wall. Cat. n. 7591); foliis lineari-subulatis subintegerrimis, nervo attingente, seta flexuosa, capsula inclinata cylindracea, operculo rostrato.—*Hook. Ic. Plant. t.* XIX. *fig.* 5. a, *plants, nat. size;* b, *leaf;* c, *point of ditto;* d, *scarcely mature capsule:—magnified.*

Hab. Nepal.—*Stems* very short. *Seta* flexuose.

66. P. *turbinata. Schwaegr. Suppl. t.* CXCIV. *Wall. Cat. n.* 7602.—Hab. Nepal.

67. Brachymenium *bryoides. Hook. in Schw. Suppl. t.* 135. *Wall. Cat. n.* 7588.—Hab. Nepal.

68. B. *Nepalense, Hook. l. c. t.* 135. *Wall. Cat. n.* 7587. —Hab. Nepal.

69. B. *acuminatum* (*Harv.*); caule breviusculo subramoso, foliis strictis (siccitate erectis) ovato-acuminatis acutis concavis integerrimis, nervo attingente, capsula erecta oblongo-pyriformi, operculo conico.—*Hook. Ic. Plant. t.* XIX. *fig.* 3. a, *plants, nat. size;* b, *leaf;* c, *capsule;* d, *peristome and annulus:—magnified.*

Hab. Penang.—*Stems* half an inch high, branched with innovations; *barren shoots* long, erect. *Leaves* ovato-lanceolate, delicately membranaceous, with large cellules.

70. B. *microstomum* (*Harv.*); caule breviusculo subramoso, foliis lanceolatis acutis subserratis erectis (siccitate strictis), nervo attingente, seta longissima, capsula erecta ovata ore angusto, operculo plano.—*Hook. Ic. Plant. t.* XIX. *fig.* 4. a, *plants, nat. size;* b. *leaf;* c, *capsule;* d, *mouth of ditto;* e, f, *portions of inner and outer peristomes:—magnified.*

Hab. Nepal.—Habit of the last, but differs in the subulate leaves, the shape of the capsule, the remarkably flat depressed operculum, and the great length of the seta.

71. B. *Weissia* (*Hook. mss.*); caule gracili breviusculo, foliis subulatis serratis strictis, nervo attingente, capsula erecta ovata, operculo conico.—*Hook. Ic. Plant. t.* XIX. *fig.* 1. a, *plants, nat. size;* b, *leaf;* c, *capsule;* d, *operculum with annulus;* e, *portion of peristome:—magnified.*

Hab. Nepal.—The smallest and slenderest of the genus.

72. B. *splachnoides* (*Harv.*); caule elongato subramoso, foliis imbricatis appressis ovatis concavis integerrimis reticulatis, nervo attingente, capsula erecta ovata vel pyriformi.—*Hook. Ic. Plant. t.* XIX. *fig.*.2. a, *plants, nat. size;* b, *leaf;* c, *apex showing the cellules;* d, *capsule with imperfect peristome:—magnified.*

Hab. Nepal.—*Stems* densely tufted; *leaves* closely imbricated and appressed, broadly ovate, pale, with large lax cellules, the nerve red. *Capsule* ovate, with an apophysis. We have not seen a perfect peristome.

* 73. Mnium *giganteum, Hook. Bot. Misc. t.* 20. *Wall. Cat. n.* 7598.—Hab. Nepal, and Himala.

74. M. *roseum*, Schreb.—*Bryum, Musc. Brit. t.* XXIX. *Wall. Cat. n.* 7596.—Hab. Nepal.

75. M. *rostratum, Schrad.—Schwaegr. Suppl. t.* LXXIX. *Wall. Cat. n.* 7595.—Hab. Nepal.

76. M. *heterophyllum, Hook. in Schwaegr. Suppl. t.* 159. *Wall. Cat. n.* 7599.—Hab. Nepal.

77. M. *lycopodioides, Hook. l. c. t.* 160. *Wall. Cat. n.* 7605. —Hab. Nepal.

78. M. *ramosum. Hook. in Linn. Trans. vol.* IX. *p.* 318. *Hook. Ic. Plant. t.* XX. *fig.* 2. a, *plant, nat. size;* b, *leaf;* c, *apex of ditto;* d, *capsule:—magnified.*

* 79. M. *rhyncophorum* (Hook. in Wall. Cat. n. 7594); surculis repentibus, caule erecto breviusculo robusto, foliis oblongo-ellipticis vel obovatis obtusis undulatis marginatis serrulatis, nervo crasso attingente, capsula ovata cernua, operculo rostrato.—*Hook. Ic. Plant. t.* XX. *fig.* 3. a, *plant, nat. size;* b, b, *leaves;* c, *capsule and operculum:—magnified.*

Hab. Penang, and North of India.—*Stems* half an inch high, throwing out long, creeping, barren shoots. *Leaves* very large, patulous and obtuse.

* 80. Sclerodontium *strictum*, (*Harv.*); caule repente nudo, ramis erectis subsimplicibus, foliis lanceolatis acutis concavis integerrimis (marginibus reflexis) erectis enervibus striatis (siccitate strictis), capsula erecta ovata.—*Hook. Ic. Plant. t.* XXI. *fig.* 2. a, *plant, nat. size;* b, *leaf:—magnified.*

Hab. Northern India.—*Stems* creeping, throwing up subsimple branches. *Foliage* dark brown, the apices of the branches golden yellow. *Leaves* straight, directed towards every side; the upper ones occasionally inclining to secund, much longer than in the following species.

* 81. S. *secundum* (*Harv.*); caule procumbente nudo, ramis erectis subramosis, foliis acuminatis ovatis acutis concavis enervibus striatis secundis integerrimis marginibus reflexis, capsula erecta ovata.—*Hook. Ic. Plant. t.* XXI. *fig.* 1. a, *plant,*

nat. size; b, *leaf;* c, *portion of ditto;* d, *portion of peristome.—magnified.*

HAB. North of India.

82. Pterogonium *ambiguum, Hook. in Linn. Trans. vol.* IX. *p.* 310. *t.* 26. *f.* 4. *Wall. Cat. n.* 7610.—HAB. Nepal.

* 83. P. *flavescens, Hook. l. c. p.* 314;—*Musc. Ex. t.* 155. *Wall. Cat. n.* 7611.—HAB. North of India.

84. P. *macrocarpum* (*Harv.*); caule repente pinnato, foliis angusto-ovatis acutis striatis enervibus marginibus patulis integerrimis, seta brevi, capsula (minuta) oblonga cernua.—*Hook. Ic. Plant. t.* XXIV. *fig.* 12. a, *plant, nat. size;* b, *leaf;* c, *capsule and seta;* d, *mouth of capsule, showing the remains of peristome;* e, *calyptra from an unripe capsule:—magnified.*

HAB. Nepal.—Spreading in extensive, dull green, matted patches. We have not been fortunate enough to discover a perfect peristome; all the capsules in our specimens being old and the opercula having fallen.

* 85. Neckera *myura, Hook. Musc. Ex. t.* 148. (*Pterogonium.*) *Wall. Cat. n.* 7620.—HAB. North of India.

* 86. N. *aurea, Hook. l. c. t.* 147. (*Pterogonium.*) *Wall. Cat. n.* 7612.—HAB. North of India.

87. N. *julacea, Hook. in Schwaeg. Suppl. t.* 245. (*Pterogonium.*) *Wall. Cat. n.* 7609.—HAB. Hilly parts of India.

88. N. *tenuis, Hook. in Linn. Trans. vol.* IX. *p.* 315. *Schwaegr. Suppl. t.* 108. *Wall. Cat. n.* 7618.—HAB. Nepal.

89. N. *cladorrhizans, Hedwig, t.* 47. *Wall. Cat. n.* 7620.—HAB. Nepal.

90. N. *tumidula, Hook. in Wall. Cat. n.* 7613.—HAB. Nepal.

91. N. *fuscescens, Hook. Musc. Ex. t.* 157. *Wall. Cat. n.* 7615.—HAB. Nepal.

92. N. *filamentosa, Hook. l. c. t.* 158. *Wall. Cat. n.* 7627.—HAB. Nepal.

* 93. N. *crispatula, Hook. l. c. t.* 152. *Wall. Cat. n.* 7617.—HAB. North of India.

94. N. *acuminata, Hook. l. c. t.* 151. *Wall. Cat. n.* 7616. —HAB. Nepal.

95. N. *dendroides, Hook. l. c. t.* 69. *Wall. Cat. n.* 7628.—HAB. Nepal.

96. N. *exserta, Hook. in Schwaegr. Suppl. t.* 244. *a. Wall. Cat. n.* 7626.—HAB. Nepal.

97. N. *crenulata* (*Harv.*); caule decumbente pinnato, ramis compressis, foliis oblongo-ovatis concavis erecto-patentibus bifariis obtusis apice crenulatis (siccitate undatis), nervo tenui ultra medium evanescente.—*Hook. Ic. Plant. t.* XXI. *fig.* 6. *leaf:—magnified.*

HAB. Nepal.—*Stems* 3-6 inches long, pendent, irregularly pinnate. *Leaves* distant, flexuose when dry, remarkably curved at the insertion, bifariously disposed, but not strictly distichous. *Capsule* immersed in a fimbriated perichætium, composed of many subulate spreading leaves.

98. N. *fimbriata* (*Harv.*); caule decumbente subpinnato, ramis compressis, foliis ovato-oblongis obtusis obliquis crispatulis patentibus bifariis, nervo apicem versus evanescente, capsula immersa, operculo conico-rostrato.—*Hook. Ic. Plant. t.* XXI. *fig.* 4; a, *plant, nat. size*; b, *leaf*; c, *point of ditto*; d, *perichætium*; e, *capsule*; *magnified.*

HAB. Nepal.—*Stems* 3-6 inches long, pendent, irregularly pinnate. *Leaves* distant, flexuose when dry, remarkably curved at the insertion, bifariously disposed, but not strictly distichous. *Capsule* immersed in a fimbriated perichætium, composed of many subulate spreading leaves.

99. N. *subserrata*, (Hook. in Wall. Cat. p. 7624); caule erecto nudo, apice pinnatim ramoso, ramis compressis, foliis elliptico-ovatis subacutis planiusculis bifariis apicibus serratis, nervo crasso subattingente.—*Hook. Ic. Plant. t.* XXI. *fig.* 7. a, *plant, nat. size*; b, *leaf*; c, *point of ditto:—magnified.*

HAB. Nepal.—*Stems* erect, 2 inches high, dendroid, rising from creeping, naked fibres. *Leaves* bifarious, their nerve very thick, disappearing just below the point. *Fruit* unknown.

100. N. *lancifolia* (*Harv.*); caule basi subnudo, apice fasciculatim ramoso, ramis compressis, foliis lanceolato-ovatis semi-serratis enervibus, inferioribus ovatis acutis subintegerrimis.—*Hook. Ic. Plant. t.* XXI. *fig.* 5. a, *upper leaves*; b, *lower leaf*:—*magnified.*

Hab. Nepal.—*Stems* erect, straggling, 2-4 inches long, subsimple below, irregularly branched above. *Leaves* closely imbricated, very straight when dry, narrow-oblong, acute, contracted and subconcave at the base, flat above, the upper half sharply serrate. Lower *leaves* much shorter and less serrate than the upper. *Fruit* unknown. This species appears to grow on the ground and to inhabit moist boggy spots; our specimens were entwined among *Dicranum glaucum and megalophyllum.*

101. N. *flexuosa* (*Harv.*); caule decumbente ramosissimo, ramis pinnatis vel bipinnatis flexuosis apicibus involutis, foliis orbicularibus obtusissimis imbricatis concavis ultra medium nervosis marginibus reflexis, capsula immersa.—*Hook. Ic. Pl. t.* XXI. *fig.* 3. a, *plant, nat. size*; b, *leaf*; c, *capsule and perichætium*:—*magnified.*

Hab. Nepal.—*Stems* pendent, 4-6 inches long, slender, diffusely branched, very flexuose, of a rich brown colour. *Leaves* orbicular, very concave, with revolute margins.

102. N. *blanda* (*Harv.*); caule decumbente? bipinnato, foliis ovatis acuminatis laxe imbricatis (siccitate incurvis) serratis marginibus reflexis, nervo subattingente, seta brevi, capsula ovata, operculo conico rostrato recto.—*Hook. Ic. Plant. t.* XXII., *fig.* 1. a, *plant, nat. size*; b, *leaf of a branch*; c, *leaf of stem*; d, *capsule*:—*magnified.*

Hab. Nepal.—A very pretty little species, resembling N. *crispatula* in miniature; but well distinguished by the broadly ovate, acuminated, strongly nerved *leaves*, incurved when dry (never secund), by the shorter and broader *capsules* and the straight *operculum*. The *leaves* of the lower portion of the stem are broadly ovate at the base, with a very sudden subulate acumination; those of the upper part are more gradually tapering.

103. N. *cordata* (Hook. in Wall. Cat. n. 7623); caule pendulo flexuoso pinnato, pinnis brevibus involutis, foliis late cordatis acutis rigidis patentibus serratis, nervo ante apicem evanescente, seta brevi, capsula ovata.—*Hook. Ic. Plant. t.* XXII. *fig.* 2. a, *plant, nat. size;* b, *leaf of stem;* c, *leaf of a small branch;* d, *capsule:—magnified.*

HAB. Nepal.—*Stems* 6-8 inches long, straggling, flexuose, mostly simple.

*104. N. *squarrosa* (Hook. in Wall. Cat. n. 7619); caule pendulo flexuoso pinnato robusto, foliis ovato-acuminatis rigidis maxime reflexis serrulatis marginibus undatis, nervo ultra medium evanescente.—*Hook. Ic. Plant. t.* XXII. *fig.* 3. a, *plant, nat. size;* b, b, *leaves:—magnified.*

HAB. North of India.—*Stems* 8-10 inches long, very robust and flexuose, irregularly pinnate; *leaves* remarkably squarrose and deflexed, very rigid, spreading on every side; *fruit* unknown. A very remarkable plant, apparently common in Nepal, as it occurs in almost every collection we have received from that country.

105. Hookeria *acutifolia, Hook. in Schwaegr. Suppl. t.* 163. *Wall. Cat. n.* 7631.—HAB. Nepal.

* 106. H. *rotulata, Smith.—Wall. Cat. n.* 7632. *Leskea, Hedw. Sp. t.* XXI.—HAB. North of India.

107. H. *prostrata* (*Harv.*); caule simpliciusculo prostrato, foliis oblongo-ovatis acutis imbricatis erecto-patentibus integerrimis, nervo tenui ultra medium evanescente, capsula ovata cernua, operculo conico papillato. *Hook. Ic. Plant. t.* XX. *fig.* 5. a, *plants, nat. size;* b, *branch;* c, c, *leaf and portion of ditto to show the cellules;* d, *mouth of capsule with operculum;* e, f, *outer and inner peristomes:—magnified.*

HAB. Sylhet.—*Stems* about an inch long, creeping throughout. *Leaves* reticulate at the base. *Calyptra* unknown.

108. H. *obtusifolia* (*Harv.*); caule simpliciusculo prostrato, foliis oblongo-ovatis subacutis (vel obtusis mucronulatis) planis imbricatis patentibus integerrimis, nervo crasso ante apicem evanescente, capsula oblonga cernua. *Hook. Ic. Plant.*

XXIV. *fig.* 11. a, *plant, nat. size;* b, *leaf;* c, *point of ditto;* d, *capsule:—magnified.*

Hab. Nepal.—*Stems* 1-2 inches long, creeping along the ground, slightly branched. *Calyptra* unknown. Larger than the last, with a differently shaped leaf and a stronger and longer nerve. Perhaps these two species belong more properly to the genus *Racopilum* of Palisot de Beauvois.

109. Leskea *aurea, Harv.—Pterogonium aureum, Hook. Musc. Ex. t.* 147.—Hab. North of India.

110. L. *longirostris, Hook. in Schwaegr. Suppl. t.* 290, a. *Wall. Cat. n.* 7640.—Hab. North of India.

111. L. *polyantha, Hedw.* var. *Indica. Hook. Ic. Plant. t.* XXIII. *fig.* 3. a, *plant, nat. size;* b, *leaves;* c, *apex of ditto;* d, *capsule;* e, *peristome:—magnified.*

112. L. *fulva* (*Harv.*); caule repente vage ramoso, foliis ovato-lanceolatis imbricatis erectis strictis subcarinatis apice serrulatis marginibus recurvis seminervibus, capsula?—*Hook. Ic. Plant. t.* XXIII. *fig.* 2. a, *plant, nat. size;* b, *leaf;* c, *apex of ditto:—magnified.*

113. L. *secunda,* (Hook. in Wall. Cat. n. 7635); caule repente pinnato, pinnis erectis falcatis, foliis ovatis acuminatis planiusculis integerrimis imbricatis secundis basi binervibus, capsula?—*Hook. Ic. Plant. t.* XXIII. *fig.* 1. a, *plant, nat. size;* b, *branch, magnified;* c, *apex of ditto.*

Hab. Nepal.

114. L.? *curvirostris* (*Harv.*); cæspitosa, caule adscendente vage ramoso, foliis imbricatis erectis strictis lanceolatis acutis integerrimis enervibus, marginibus recurvis, capsula cernua ovata, operculo curvato longe rostrato.—*Hook. Ic. Plant. t.* XX. *fig.* 4. a, *plants, nat. size;* b, *leaf;* c, *perichætial leaf;* d, *capsule;* e, *peristome:—magnified.*

Hab. Nepal.—*Stems* an inch or two long, suberect, tufted.—In habit, and in the inclined capsule, this species differs from most others of the genus; but the inner fringe is that of a true *Leskea,* consisting of 16 robust ciliæ, alternating with the teeth of the outer peristome.

115. L. *pterogonoides* (*Harv.*); caule repente, ramis vagis subfasciculatis curvulis, foliis imbricatis erectis elliptico-ovatis submucronatis concavis carinatis marginibus reflexis integerrimis, nervo ultra medium evanescente, capsula erecta oblonga, operculo conico acuto.—*Hook. Ic. Plant. t.* XXIV. *fig.* 8. a, *leaf;* b, *capsule;* c, *mouth of ditto, showing remains of peristome:—magnified.*—HAB. Nepal.

116. Hypnum *abietinum, Hedw. Musc. frond. t.* XXXII. *Wall. Cat. n.* 7654.—HAB. Kamoun.

*117. H. *spinæforme, Hedw. Musc. frond. t.* XXV. *Wall. Cat. n.* 7651.—HAB. Penang, and N. of India.

118. H. *Wallichii, Hook. in Schwaegr. Suppl. t.* 219. *Wall. Cat. n.* 7647.—HAB. Nepal.

*119. H. *minutulum, Hedw. Musc. frond. t.* XXXIV. *Wall. Cat. n.* 7641.—HAB. Frequent in India.

*120. H. *proliferum*, L.—*Musc. Brit. t.* XXV. *Wall. Cat. n.* 7643.—HAB. India, frequent.

121. H. *Fabronia.* (*Helicodontium,*) *Hook. in Schwaegr. Suppl. t.* 291. *Wall. Cat. n.* 7634.—HAB. Nepal.

122. H. *albescens, Hook. l. c. t.* 226, b.—HAB. Nepal.

123. H. *Nepalense, Hook. l. c. t.* 226, a. *Wall. Cat. n.* 7649.—HAB. Nepal.

124. H. *ruscifolium, Neck.—Musc. Brit. t.* XXVI. *Wall. Cat. n.* 6744.—HAB. Nepal.

125. H. *aureo-nitens, Hook. l. c. t.* 221.—HAB. N. of India.

126. H. *tomentosum, Hedw.—Pal. Beauv. Mem. Linn. Soc. Paris, part* 1. *t.* IX. *fig.* 6.—HAB. N. of India.

127. H. *cupressiforme*, L. *Musc. Brit. t.* XXVII.—HAB. N. of India.

*128. H. *Buchanani, Hook. in Linn. Trans. vol.* ix. *p.* 320. *Schwaegr. Suppl. t.* 224, a. *Wall. Cat. n.* 7645.—HAB. Nepal.

129. H. *alopecurum*, L.—*Hook. Musc. Brit. t.* XXV.—HAB. Nepal.

130. H. *serpens*, L.—*Musc. Brit. t.* XXV. *Wall. Cat. n.* 7646.—Hab. Nepal.

131. H. *elegans*, *Hook. in Schwaegr. Suppl. t.* 282, a. *Wall. Cat. n.* 7648.—Hab. Nepal.

132. H. *punctulatum* (*Harv.*) ; caule repente vage pinnato, foliis ovato-ellipticis acutis concavis serrulatis enervibus dorso minutissime punctulatis, capsula ovata cernua.—*Hook. Ic. Plant. t.* XXIII. *fig.* 10. a, *plant, nat. size ;* b, *leaves ;* c, *capsules :—magnified.*

β. caulibus foliisque minoribus, capsula nutante.

Hab. Nepal.—*Stems* creeping in wide patches; foliage very pale.

133. H. *papillatum* (*Harv.*) ; caule subpinnato tenui, foliis ovato-lanceolatis longe acuminatis subserratis concavis enervibus dorso papillosis, capsula ovata cernua.—β. *tenuissimum ;* foliis cirrhato-acuminatis subserratis concavis enervibus dorso papillosis, capsula ovata cernua.—*Hook. Ic. Plant. t.* XXIII. *fig.* 8. a, *nat. size of* α; b, *var.* β; c, *leaf of* α; d, *leaf of* β; c, *capsule of* α :—*magnified.*

Hab. Nepal.—*Stems* irregularly pinnate, foliage pale. Nearly related to the preceding, but a much slenderer plant, with lanceolate, often linear-acuminate leaves, which are distinctly papillose on their under surface.

134. H. *microcarpum* (Hook. in Wall. Cat. n. 7657); caule repente vage ramoso subpinnato, foliis lineari-lanceolatis acuminatis enervibus integerrimis concavis patentibus, seta brevi, capsula minuta oblonga cernua.—*Hook. Ic. Plant. t.* XXIII. *fig.* 4. a, *nat. size ;* b, b, *leaves ;* c, *capsule.*

Hab. Nepal.—*Foliage* fulvous, silky. *Capsule* very smooth; *seta* short.

135. H. *curvulum* (*Hook. Mss.*) ; cæspitosum, caule erecto vage ramoso, foliis falcato-secundis ovatis acuminatis integerrimis enervibus apice incurvis, capsula ovato-oblonga cernua, operculo rostrato.—*Hook. Ic. Plant.* XXIII. *fig.* 7. a, *nat. size;* b, *leaves ;* c, *capsule :—magnified.*

Hab. Nepal.

136. H. *retroflexum* (Hook. in Wall. Cat. n. 7656); caule repente pinnato, ramis erectis, foliis ovatis acuminatis squarrosis patentissimis planiusculis enervibus, siccitate recurvis, capsula ?—*Hook. Ic. Plant. t.* XXIII. *fig.* 6. a, *nat. size;* b, *leaves :—magnified.*

137. H. *cyperoides* (Hook. in Wall. Cat. n. 7653); caule repente pinnato, ramis patentibus compressis, foliis subdistichis patentissimis ovatis acutis planiusculis minutissime serrulatis basi sub-binervibus, capsula ovata horizontali, operculo curvirostrato.—*Hook. Ic. Plant. t.* XXIII. *fig.* 5. a, *nat. size;* b, b, *leaves;* c, *capsule:—magnified.*

HAB. Nepal.—Pale green. *Stems* closely and regularly pinnate.

138. H. *propinquum* (*Harv.*); caule repente pinnato, ramis compressis, foliis falcato-secundis lanceolatis apice incurvis enervibus, capsula inclinata cylindracea, operculo e convexo longirostro.—*Hook. l. c. t.* XXIV. a, *leaf;* b, *capsule:—magnified.*

HAB. N. of India.

139. H. *humile* (*Harv.*); caule repente pinnato, pinnis erectis, foliis undique imbricatis ovato-lanceolatis concavis enervibus marginibus patulis integerrimis, capsula oblonga horizontali.—*Hook. l. c. t.* XXIII. *fig.* 9. a, *nat. size;* b, *leaves;* c, *capsule:—magnified.*

140. H. *Tavoyense* (Hook. in Wall. Cat. n. 7655); caule repente prostrato vage ramoso, foliis bifariis subdistichis ovatis acutis planis flaccidis patentibus integerrimis seminervibus, capsula horizontali oblonga, operculo conico.—*Hook. l. c. t.* XXIV. *fig.* 1. a, *plant, nat. size;* b, b, *leaves;* c, *capsule;* d, *portion of the peristome:—magnified.*

HAB. Tavoy and Penang.—*Stems* prostrate; foliage bright grass green. *Capsule* very small. Interior *peristome* as in *Stereodon, Brid.*—A very handsome species.

141. H. *Kamounense* (*Harv.*); caule repente vage pinnato, ramis curvatis, foliis imbricatis ovatis erectis longe acuminatis subconcavis striatis serrulatis seminervibus, capsula ovato-oblonga cernua, operculo conico, seta lævi.—*Hook. Ic. Plant.*

t. XXIV. *fig.* 10. a, *leaf;* b, *point of ditto;* c, *capsule;* d, *portion of inner peristome.*

Hab. Kamoun.

142. H. *inflexum* (*Harv.*); caule tenui repente vage pinnato, pinnis secundis erectis involutis brevibus, foliis ovatis acuminatis imbricatis integerrimis enervibus (siccitate adpressis apicibus patentibus), capsula ovata cernua.—*Hook. Ic. Plant. t.* XXIV. *fig.* 6. a, *leaf;* b, *capsule;* c, *portion of inner peristome:—magnified.*

Hab. Nepal.—Habit of *Neckera julacea;* but much smaller, with more acuminate leaves, and the inner peristome proper to the genus *Hypnum*, and the subgenus *Stereodon* of Bridel.

143. H. *vagans* (*Harv.*); caule debili vage pinnato, foliis ovatis acutis planis serratis subcarinatis distantibus patentissimis subbifariis, nervo ultra medium evanescente, capsula oblonga cernua, operculo longirostro.—*Hook. Ic. Plant. t.* XXIV. *fig.* 2. (H. *remotifolium, Hook. Mss.*, not of *Grev. and Schwaegr.*) a, *leaf;* b, *capsule:—magnified.*

Hab. Nepal.

144. H. *ambiguum* (*Harv.*); caule repente pinnato, pinnis erectis, foliis ovatis acutis planiusculis erecto-patentibus serrulatis marginibus patulis, nervo brevi, capsula sphærica horizontali.—*Hook. Ic. Plant. t.* XXIV. *l. c. fig.* 4. a, *leaf;* b, *capsule:—magnified.*

Hab. Nepal.

145. H. *cordatum* (*Harv.*); caule adscendente vage pinnato, foliis cordatis acutis serratis distantibus erecto-patentibus marginibus basi patulis, nervo ante apicem evanescente, capsula ovata cernua.—*Hook. Ic. Plant. t.* XXIV. *fig.* 7. a, *leaf;* b, *capsule:—magnified.*

Hab. Nepal.

146. H. *alopecuroides* (*Hook. Mss.*); caule repente, divisionibus erectis dendroideis pinnatim ramosis, foliis ovato-oblongis ultra medium contractis patentibus undique insertis (siccitate intortis) marginibus reflexis integerrimis, nervo ante apicem evanescente.—*Hook. Ic. Plant. t.* XXIV. *fig.* 5. a, *plant, nat. size;* b, *leaf;* c, *point of ditto:—magnified.*

HAB. Nepal.

147. H. *Haplophynemum.—Leskea microphylla, Hook. in Wall. Cat. n.* 7638.—*Haplophynemum microphyllum. Schwaegr. Suppl. t.* 271.

HAB. Nepal.

148. H. *nervosum* (*Hook. Mss.*); caule debili vage bipinnato, foliis cordato-subulatis crassis papillosis serrulatis patentibus squarrosis, nervo incrassato attingente, capsula cernua ovata.—*Hook. Ic. Plant. t.* XXIV. *fig.* 3. a, *plant, nat. size;* b, *leaves;* c, *capsule:—magnified.*

HAB. Nepal.

II.—*On the establishment of the genus* Mouriria, *Juss., as the type of a new Natural Order; together with notes and observations on the structure of the genera* Lygodisodea, Cassytha, *and* Carludovica. By Mr GEORGE GARDNER, Surgeon.

[With 3 Plates.]

BOTANISTS seem to be uncertain as to what Natural Order the genus *Mouriria* ought to be placed in, although it is agreed that its characters, so far as hitherto known, give it an intermediate station between *Myrtaceæ* and *Melastomaceæ*. Such, according to De Candolle, is the opinion of Brown and Meyer; and De Candolle himself places it in *Memecyleæ*, provisionally, from his being unacquainted with the structure of the seeds. Having recently found in one of my excursions in this neighbourhood a species* of the genus in flower and with seeds sufficiently matured to ascertain their structure, I am inclined to consider it, from reasons shortly to be given, as the type of a new Natural Order; and with the assistance of De Candolle's generic description, I have drawn up the following character of the tribe.

* This appears to be a new species, so far as my necessarily limited library enables me to judge. It differs from all those described in De Candolle's Prodromus, in having obtuse apiculate leaves, with the *venæ arcuatæ* forming a well marked marginal vein. Like *M. cauliflora*, DC., its flowers are produced from the trunk and branches. It is *M. Pusá*, Gard. MSS. and No. 1608 of the Collections from the Province of Ceará.

MOURIRIACEÆ.

Calyx bibracteolate at the base; tube adhering to the ovarium; limb urceolate, 5-toothed. *Petals* 5, broad at the base, inserted into the summit of the tube of the calyx, and alternating with its segments, contorted in æstivation. *Stamens* 10, subunequal, inserted immediately below the petals:—*filaments* curved downwards in æstivation:—*anthers* oblong-triangular, infractuose at the base, opening laterally at the apex by two slits. *Ovarium* subglobose, 5-celled, each cell containing one ovule. *Style* filiform. *Stigma* capitate. *Fruit* a subglobose *berry*, crowned by the persistent limb of the calyx, 1 rarely 2-celled, cells 1-seeded. *Embryo* erect, exalbuminous. *Cotyledons* large, plano-convex. *Radicle* inferior, straight. *Plumule* inconspicuous.—*Trees* or *shrubs* of America, *glabrous;* branches *nodose.* Leaves *opposite, exstipulate, entire, coriaceous, with elevated dots, penninerved, and, in one species, at least, having the* venæ arcuatæ *forming a distinct marginal vein.* Flowers *axillary, pedunculate, white, yellow, or rose coloured.*

The nearest affinity of this small tribe of plants is evidently with *Myrtaceæ* and *Melastomaceæ*, but it cannot be placed in either of these families without very materially weakening their characters. With *Myrtaceæ* it agrees in habit, in the nature of its leaves, which have elevated dots, and, in one instance, marginal veins, and somewhat in the structure of its fruit, which, however, in *Myrtaceæ* is very variable. It differs essentially from this Order in the contorted, not quincuncial, æstivation of the petals, and in the dehiscence of the anthers. With *Melastomaceæ* it corresponds in the æstivation of the petals and filaments, and in the dehiscence of the anthers, which, however, is not by pores but by slits; but is abundantly distinct from that order in the calyx having a perfect union with the ovarium, in its definite ovules, and in the leaves being destitute of parallel veins, and having elevated dots. From *Memecyleæ* it is distinguished by its erect, not pendulous, embryo, by its fleshy plano-convex, not foliaceous convoluted, cotyledons, and by its inferior, not superior radicle. According to Lindley (*Introd. Nat. Syst. ed.* 2. *p.* 41, *in note,*)

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Mouriria Pusa

the Order *Memecyleæ* has been reduced to *Melastomaceæ* in *Linnæa*, X. 217; but the affinities of the genus *Mouriria*, at least, are much greater with *Myrtaceæ* than with *Melastomaceæ*. In the lineal arrangement of the orders, *Mouririaceæ* must hold an intermediate station between these two orders, and will thus form the transition link that unites them.

The species, above noticed, from which Mr Gardner has drawn up his remarks, is an entirely new one. We therefore adopt his name, and would thus distinguish it;

M. *Pusa*, (Gardn. mst.); foliis ellipticis cum mucronulo coriaceis lævissimis impunctatis tenui-cartilagineo-marginatis nervis obsoletissimis, umbellis pauci—(2—3) floris e ramo vetusto ortis, pedicellis calyce longioribus, antheræ calcare brevissimo.—(TAB. I.)

HAB. Dry hilly plains near Crato, in the province of Ceara, where the fruit is much esteemed, and called by the natives *Pusa*. (*Gardner*, 1608.) This, Mr Gardner remarks, is a small tree, with an upright stem, and horizontal branches; about ten feet high. Leaves exactly elliptical, with a short mucro, remarkable for their very thick, coriaceous substance, perfectly smooth on both sides, not in the least dotted, and having a very narrow cartilaginous margin. The intra-marginal nerve which Mr Gardner alludes to in his note, is, in the dry state at least, and even when soaked in water, extremely indistinct, as are the transverse lateral nerves. The flowers are thrice the size of those of *M. Guianensis*, and almost as large as in my *Guildingia*, Bot. Misc. vol. i. p. 122, t. 30, (*Olisbea*, De Cand., who doubtfully refers it to *Rhizophoreæ*,) a genus indeed which only differs from *Mouriria* in the mode of rupture of the calyx. In M. *Pusa*, Mr Gardner describes the ovary as five-celled, the cells with one ovule. I find, in two ovaries which I examined, three cells, each cell with three closely compacted ovules, arising from a small fleshy receptacle at the base. The fruit is as large as that of the common wild cherry, obliquely globose, crowned with the persistent segments of the calyx.

TAB. I. *fig.* 1, flower. *fig.* 2, anther. *fig.* 3, fruit, *nat. size. fig.* 4, section of the ovary; each cell having three erect closely placed ovules. *fig.* 5, ovules on their receptacle from the bottom of the cell:—*magnified.*—ED.

The original species of the genus may be thus characterized:—

M. *Guianensis*, foliis ovato-acuminatis subcoriaceis emarginatis distincte venosis utrinque minute elevato-punctatis, umbellis pauci—(2—3) floris in ramos juniores axillaribus, pedicellis calyce multo longioribus, antheræ calcare elongato.

Mouriria Guianensis. *Aubl. Guian.* i. *p.* 453. *t.* 180. Petaloma Mouriri, *Sw.*

Hab. Guiana, *Aublet*. Brazil; common along the shore from Maccio to the mouth of the San Francisco. *Mr Gardner*, (*n*. 1310.)—"Flowers tinged with pink. Berries scarlet," about the size of a pea.

A new species exists in Mr Schomburgk's collection from Guiana, which may be thus distinguished:—

M. *brevipes;* foliis late ovatis acuminatis coriaceis opacis immarginatis nervis omnino obsoletis utrinque minute impresso-punctatis, costa supra canaliculata, umbellis paucifloris congestis sessilibus 2—3-floris in ramos juniores axillaribus terminalibusque, pedicellis calyce brevioribus, antheræ calcare elongato.

Hab. Guiana, *Mr Schomburgk*, (*n*. 690).—Flowers much crowded in very short fascicles. The leaves are singularly opaque on the surface, exhibiting no trace of nerves whatever. From the three above species, *M. grandiflora*, (Mart. in De Cand.) seems very distinct, though I judge from an imperfect but authentic specimen in my Herbarium.)—Ed.

LYGODISODEA, *Ruiz et Pavon*.

This curious genus has been made the type of a new Natural Order, by Bartling, which is adopted by Lindley and Martius, while De Candolle places it in his tribe *Pæderieæ* of the Order *Rubiaceæ*. Both Bartling and De Candolle seem to have made their observations on the structure of the genus from the same source, viz. specimens in the herbarium of Hænke; the former altogether erroneously, the latter with his wonted, almost unerring sagacity. The description which De Candolle gives quite corresponds with the structure of the recent fruit of a new species, which I have lately added to my collections. It was out of flower, but the following are the notes which I made from the fruit and seeds:—*Fruit* indehiscent, oval, compressed, shining, crowned by the persistent teeth of the calyx. *Tube of the calyx* at length separating completely from the carpels, fragile, bursting irregularly from the bottom. *Carpels* two, oval, compressed, winged, applied to each other by their flattened internal surfaces, each suspended by a slender free cord, which arises from the bottom of the calyx, and passes upward along the middle of their backs to their apices. *Embryo* erect in the centre of a thin horny *albumen*. *Radicle* inferior, long, cylindrical. *Cotyledons* cordate, foliaceous. *Plumule* inconspicuous.

Lygodisodea Brasiliensis.

It is quite obvious, that what Bartling considers to be the pericarp, is nothing more than the calyx which at length separates from the carpels, the shining appearance of which is owing to the falling off of the epidermis, and that his two pendulous seeds are the two carpels. This, together with the inferior radicle, not (superior as stated by Bartling,) and the distinct existence of albumen, completely annihilates Bartling's Order, and proves the correctness of the situation in which the genus has been placed by De Candolle.

(The species of *Lygodisodea* above alluded to, is, it must be confessed, very nearly allied to the original *L. fœtida* of Ruiz and Pavon, a native of woods in Peru. But when we come to consider the widely separated locality of the two plants, and the different form of their leaves, it will be safer perhaps to look upon them as distinct, and we may call Mr Gardner's species—

L. *Brasiliensis;* foliis cordato-ovatis acutis supra glabris subtus in axillis hirsutis, dentibus calycinis valde inæqualibus.—(Tab. II.)

Hab. Among bushes at Serra de Araripe; only two specimens could be found, *Mr Gardner, (n.* 1698.*)* It is to be regretted that Mr Gardner did not find any flowering specimens, although from the very immature state of some of the fruit, it would appear that the corolla had only recently fallen. A striking difference is observable between this very young and the mature fruit, the former having a softish wrinkled dark-green covering, crowned with the very unequal teeth of the calyx, of which two or three are very long, the other two or three extremely short, while the ripened fruit is smooth and glossy, chestnut-brown, and only terminated by very short, though yet unequal teeth, a difference that cannot be accounted for except by what Mr Gardner mentions above, "the falling off of an epidermis." The ripened fruit is then surrounded by the calyx which has parted with its epidermis, and this calyx is marked by five lines or striæ, five corresponding with and five alternating with the teeth of the limb. The tube itself, glossy and membranaceous, splits irregularly from the base, falls off, and leaves two flat, black, broad, oval carpels, placed face to face, each surrounded by a broad membranaceous wing, and attached to the bottom of the calyx by an erect cord or slender stalk, from the top of which it is pendent; each carpel has besides another cord springing from the base of the carpel, and fixing it to the base of the calyx. Upon the surface of the carpels are several very minute white scales or short thickened hairs. Within is a very thin, soft, and fleshy albumen, in which lies the large pure white embryo, of which the cotyledons are flat, thin, 3-nerved, broadly cordate. Radicle inferior.

Tab. II. *fig.* 1, young fruit with its epidermis. *Fig.* 2, ripe fruit, the

calyx bursting from below and about to fall off. *Fig.* 3, the two carpels, the calyx having separated. *Fig.* 4, single carpel, inner view. *Fig.* 5, transverse section of a carpel. *Fig.* 6, embryo:—*magnified.*)—Ed.

CASSYTHA. *Linn.*

Hitherto included in the Natural Order *Lauraceæ*, this genus has recently been separated from that tribe, and constituted a distinct Order by Dr Lindley, chiefly from it being "too violent a shock to our ideas of resemblance, to include in the very same order a plant like our wild *Cuscuta*, and the noble forest-trees of which the majority of *Lauraceæ* consists." (*Lindl. Nat. Syst. 2d ed. p.* 202.) The character which he gives of the Order, is taken from Nees Von Esenbeck, who ranks it as a section of *Lauraceæ;* and in Dr Lindley's opinion it seems to contain sufficient distinctions, independent of habit, to define *Cassythaceæ* as a peculiar Order. An examination of the recent flowers and fruit of a species of this genus, which I have lately found near this place, exhibits a very different structure from that given by Nees Von Esenbeck as adopted by Lindley. This species grows on the ascent of the Serra de Araripe, twining principally on the stems and branches of a tall fruticose species of *Œnothera*, and the stems of a species of *Lisianthus*. It agrees with the character of *Cassytha pubescens*, R. Br., as given in Sprengel's *Systema Vegetabilium*, and is probably the same species. The following note was made at the time of examination:—*Tube* of the *calyx* free, globose; *limb* 6-parted, converging, the segments in two rows, those of the external row much smaller than those of the internal; *stamens* 9, inserted on the tube of the calyx in three circles, the external and internal row alternating with the large calycine segments, the middle row opposite to them. External to the three inner stamens, there is a row of three small yellow glands, and internal to them another row of three also; *anthers* 2-celled, the cells of the two external rows opening inwards, from the base to the apex by permanent valves, those of the inner row open outwards in the same manner; *ovarium*

superior, 1-celled; ovule 1, suspended. *Style* 1. *Stigma* simple. *Caryopsis* free, included in the fleshy perianth, black, slightly rugose, crowned by the persistent style; *seed* exalbuminous; *embryo* inverted; *cotyledons* plano-convex, peltate at the base; *radicle* superior, short, included; *plumule* conspicuous, 2-leaved.

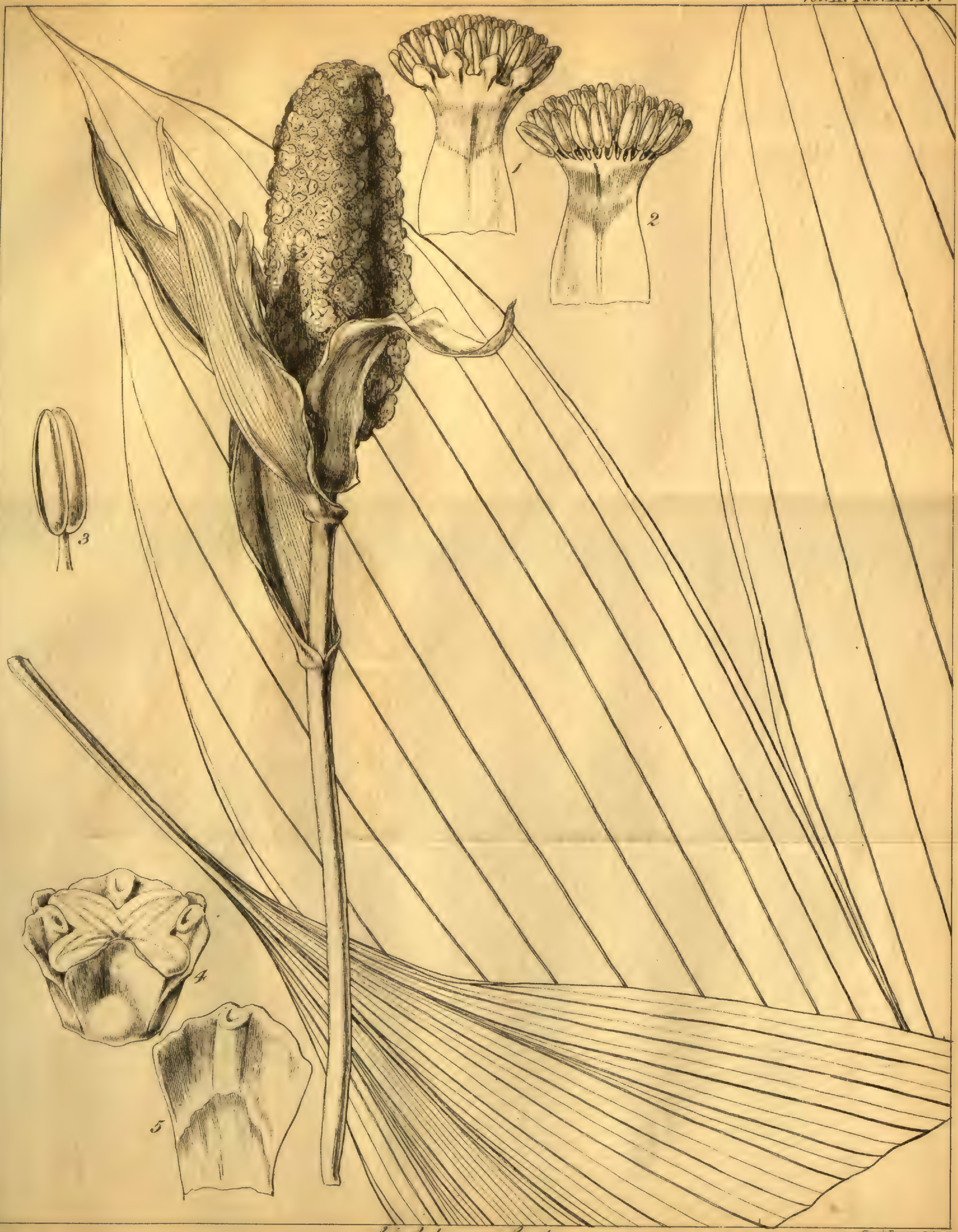
In the character of *Cassythaceæ*, as adopted by Lindley, the want of glands at the base of the inner stamens appears to me to be the sole circumstance in which the Order differs from *Lauraceæ;* and as they certainly exist in the only species which I have had an opportunity of examining, it is to be inferred that they exist in all. The Order then has nothing to distinguish it from *Lauraceæ*, but its leafless twining parasitical habit, a character certainly not of sufficient importance to constitute the establishment of a distinct Order. If habit alone, without a well marked difference in the organs of fructification, is to be taken as a sufficient ordinal distinction, there will be no end to the creation of new groups at the expense of the old. Many Orders as at present constituted, and conceived to rest on solid grounds, contain as anomalous genera as does *Lauraceæ*, with *Cassytha* retained in it; take for example *Euphorbiaceæ*, *Cactaceæ*, *Asclepiadaceæ*, *Urticaceæ*, and even *Orchidaceæ*. If *Cassythaceæ* had characters as well marked as those of *Illigeraceæ* to separate it from *Lauraceæ*, it would be well to keep them distinct; as it is, it must still be retained as a section of the latter Order.

CARLUDOVICA. *Ruiz et Pavon.*

A species of this genus, (*C. Gardneri,*) which grows in damp shady ravines on the mountains in this vicinity, has afforded me an opportunity of examining the structure of its fructification also, which, judging from the generic character given by Sprengel, in his *Systema Vegetabilium*, the only book on the subject which I can at present consult, seems to be very ill understood. He considers the genus monœcious, and gives the male flowers a many-toothed calyx, and, to the female,

one of 4 sepals. Lindley in his Natural System, adopts the character of the tribe to which it belongs—*Cyclanthaceæ*, from Schott, who considers the whole order monœcious or polygamous, with the male and female flowers arranged alternately in spires. Nothing, however, can be more certain than that the flowers are hermaphrodite, and destitute of floral envelopes in the species which I have examined, and from which the following note was made :—*Spatha* 4-leaved. *Spadix* cylindrical, densely floriferous. *Flowers* hermaphrodite, destitute of floral envelopes, spirally arranged. *Stamens* numerous, borne upon four flat membranous bodies (longer than the ovarium) and which arise from a narrow membrane that surrounds the superior part of it. *Anthers* 2-celled. *Ovarium* inferior, 1-celled, crowned by a concave cruciform body which seems to be an operculum, for it has no connexion with the internal economy of the ovary. *Styles* 4, long, flattened above, deciduous, attached by their base to the inside of four broad obtuse fleshy scales, which are situated above the ovarium, and immediately before each bundle of stamens. *Stigmas* small, 2-lobed, turned downwards so as to give the tops of the styles a hooked appearance. *Fruit* a fleshy quadrangular, 1-celled *berry*, crowned by the persistent scales and cruciform organ already mentioned. *Seeds* numerous, small, flat, attached horizontally to four parallel placentæ, which are protruded inwards so as to give them the appearance of being free, and nidulating in a glutinous pulp. *Inflorescence* axillary.

(In the view Mr Gardner has been led to take of the character of this genus, he has considered the four separate scales bearing stamens, which he finds to surround each female flower, as belonging to that flower, consequently as affording an example of hermaphrodite blossoms ; but if we look carefully into the structure of these male scales, it will be more correct to consider them as separate male flowers :—for although they are flat and membranaceous *below*, they expand *upwards* into a cup-shaped perianth, the edge being fringed with stamens (those at the back, or the edge not directed to the pistil, reduced to abortive glands), and within having 2 or 3 series of stamens. The filaments are short; anthers oblong, 2-celled ; cells opening at the two opposite margins ; this edge of the cup is



Carludovica Gardneri.

Allan & Ferguson Lithrs

nearly entire. Poeppig describes this perianth as having two series of lobes. —The pistil, or female flower, is short, subtetragonal, united, for half the length from the base, with four broadly obovate scales (the perianth), rather longer than the pistil, having a tubercle near the apex with a scar, whence we presume the curious flattened filaments have fallen, which we believe are common to all the species of the genus, these Mr Gardner describes as being deciduous, and they seem to have entirely disappeared from our specimens: Mr Gardner has looked upon them as the styles. Style, in reality, there is none. Stigma large, peltate, cruciform, the lobes alternating with the four scales just described. Ovary as shown in *Bot. Mag. t.* 2951, 1-celled, with four parietal lobes to which the ovules are attached. Mr Gardner's species seems to be distinct from any yet described. We would call it—

C. *Gardneri;* foliis obovatis in petiolum attenuatis ultra medium bifidis lobis erectis oblongo-ovatis acuminatis, pedunculis axillaribus, spadice florum cylindracea. (Tabs. III. IV.)

Hab. Moist rocky places in shady ravines, Serra de Araripe, Brazil. *Mr Gardner. n.* 1866.

Tabs. III. IV. *fig.* 1, male flower, back view. *Fig.* 2, the same, front view. *Fig.* 3, stamen. *Fig.* 4, female flower. *Fig.* 5, scale separated from the female flower, showing the scar near the apex, whence the long flattened filament had fallen :—*magnified.*)—Ed.

Villa do Crato, Sertao of the
Province of Ceará, Brazil,
December 1, 1838.

III.—BOTANICAL INFORMATION.

UNIO ITINERARIA.

[We have received the following account of this valuable Society, translated by Mr William Pamplin, jun., (the London agent for these collections,) from the German circular transmitted by Dr Steudel.]

The Members of the Wurtemberg Natural History Travelling Society, and all friends to Natural History, especially Botany, are informed, that satisfactory tidings have recently

been received respecting William Schimper's interesting travels in Abyssinia.

We proceed to give some details, extracted from a letter just arrived.

In the close of February last, this enterprising traveller reached Massova on the Red Sea, bringing with him the bulk of his valuable collections, a small part only having been necessarily left at Adoa. During the month of May of the preceding year, M. Schimper had visited the mountains of Semen, where he spent the summer in investigating the Flora of those very high alpine regions, and where he suffered severely from frequent rain and snow, accompanied with much cold. Thence he directed his steps in September to Tackatze, and adding the collections of these different districts together, he returned to his starting-point, Adoa, in October. Our traveller despatched the first portion of his treasures by Massova to Djedda, and we may soon look for their arrival by way of Suez and Alexandria. The remainder, including the collection left at Adoa, it is M. Schimper's intention to bring home himself; but first, he desires to devote a short time to a thorough investigation of the botanical productions of the lower coast, inhabited by a people called Schocho, so that he may be able to amass and lay before the naturalists of Europe a complete Flora of Abyssinia.

M. Schimper's collections will thus contain:—

I. The principal part of the coast vegetation, to the altitude of 4000 feet above the sea.

II. The Flora of the vicinity of Adoa, from 4000 to 8000 feet above the sea.

III. The plants of the Alpine district of Semen, extending to a height of 12,000 feet.

IV. The vegetation of the Tackatze, a river, which, descending from the Abyssinian Alps, empties itself at length into the Nile.

That these collections are of immense importance to science is evident; and we cannot doubt that the respected

members of the *Unio Itineraria*, will cheerfully contribute towards defraying the heavy expenses which must still be incurred in bringing them to Europe, as well as remunerating the enterprising traveller, who, braving dangers and hardships that few *could* have endured, and still fewer would have *chosen* to endure, has amassed these treasures in a little known and most perilous country.

Of course, those friends to the cause who desire to possess the largest and most complete shares which can be formed from the whole mass, must, in addition to their customary subscriptions, make, if required, a proportionate advance of money; and we now mention what has been already stated on former occasions, that such members as have subscribed for a less sum than 90 florins, will be charged higher, in proportion, than those whose contributions exceed that sum. The prerogative thus secured to subscribers of 90 florins and above, will, however, cease if their remittances are delayed till after the arrival of the collections in Esslingen. Thus, the earlier our friends come forward, the more advantageous will it be for themselves, as well as for the interests of the expedition, since the money advanced by M. Dunreicher of Alexandria, the gentleman who has provided our travellers with the necessary supplies, must be promptly refunded to liquidate the expenses. Judging from the information received, the number of species now collected may amount to from 1500 to 2000; and if matters turn out favourably, if few of the specimens are damaged, and if M. Schimper's expenses in conveying himself and his luggage home to Europe, do not exceed our calculations, then we may reckon, as formerly, that these plants will cost the subscribers 15 florins the hundred, provided we receive a sufficient number of orders. Our friends can make their arrangements accordingly, and must also perceive how greatly they are likely to be advantaged by early application and aid.

From thus announcing the approaching and successful close of Schimper's Travels, we pass on to intimate that two expeditions of a similar nature have been set on foot by us. One

of them consists in a journey, closely bearing in its object and place of destination on that of M. Schimper, and the individual employed is M. Kotscky, who visited last year the territories of Sennaar, Fasokal, Cardofan, and the Free Negroes, having been sent thither by the government of Austria to make botanical collections, which were transmitted to Vienna. This courageous and most industrious young man, already well skilled in collecting specimens of natural history, and especially *au fait* in what regards the preservation of plants, has offered to supply our Society with the productions of the above-named countries, which he is now visiting for the second time. As we have agreed to his terms, and are expecting an arrival from him this present autumn, so we now invite all naturalists to subscribe from 30 to 60 florins, the price of the plants being the same as those of Schimper from Abyssinia, and forming a very desirable adjunct to that collection, whether for elucidation or comparison.

The other expedition is even now well known to the botanical world, as being confided to Dr Welwitsch from Vienna, who has already started in order to explore the Cape de Verd and Azores Islands. It is true, that these first islands have been already visited by M. Brunner of Berne, and the latter by M. Gruthwick and M. C. Hochstetter, and these gentlemen returned last year with highly interesting botanical collections. But their stay was too brief to admit of a thorough research of the vegetable productions of these islands, while the success that attended their investigations was so encouraging, as to promise very important results to future travellers, especially when viewed as throwing light on that interesting subject —the Geographical Distribution of Plants.

The Flora of the Cape de Verd Islands, touching as it were, on one side, that of Senegambia, and on the other, that of the Canaries, is important, as offering to view the vegetation that prevails in the extreme western limit of the Temperate Zone in this our hemisphere. For this reason, it is Dr Welwitsch's desire, should circumstances prove favourable, to explore Ténériffe, the loftiest island of the Canary

group, and to enrich his collection with the rarer and more peculiar productions of these islands. For this journey, each single share must be paid in advance, 24 florins; and those who wish to secure complete sets, will do well to take double or quadruple shares.

Lastly, we state that the selection from the Georgio-Caucasian Flora is still proceeding; but as soon as a sixth delivery appears, then the earlier portions can no longer be obtained.

			Florins.
I. The fourth delivery of	120 species,	. .	15
II. The fifth do.	200	. . .	25
III. Collection of the several prior selections, amounting altogether, to	300 species	. .	40
Do. do.	400	. . .	50
Of the Arabian Plants, there remains one century at			15
Of the N. American . . .	200	.	24
Do. do. . . .	100	.	12

We request that letters and money sent to us, be either transmitted postage free, or that such a sum may be added as will cover the charge.

PROFESSOR HOCHSTETTER.
DOCTOR STEUDEL."

ESSLINGEN, *August*, 1839.

(Since the above was transmitted, that is in Dec. 1839, Mr W. Pamplin has received further intelligence from Dr Steudel respecting Mr Schimper's Abyssinian Collections, namely, that one half of them, in 16 cases, were (on the 4th Dec. last,) actually on their passage from Alexandria to Trieste, and it is expected they will be ready for distribution early in the present year, (1840.) Dr Steudel recommends that those subscribers who have not already done so, should advance a deposit of not less than 90 florins, (£9 9*s*. sterling,) on such portions of the collections as they may wish to take; and that those who desire to secure one entire share, 1500 to 2000 species, say at 15 florins per century, amounting to 300 florins, should advance not less than 180 florins (£18 18*s*. sterling.) He also invites subscribers for the seeds Mr Schimper has collected in Abyssinia, and offers collections of 100 species for 20 florins, or £2 2*s*. sterling.

Subscriptions are also received for Kotschy's Sennaar (S. Nubia) Plants,

and for Welwitsch's Azores collections, at 60 florins. These will be valued at the same rate as those of Abyssinia, namely, 15 florins (£1 11*s*. 6*d*. sterling,) the 100 species.)—Ed.

MR GARDNER'S COLLECTIONS.

(A press of original papers compels us to omit, in the present number, much interesting miscellaneous botanical information with which we are provided, and which we shall reserve for our future pages. We must, however, devote a little space to the most recent intelligence received from Mr Gardner. In the Annals of Nat. Hist. v. iii. page 327, are detailed the particulars of his travels as far as Cráto in the province of Ceará, where he arrived the end of the year 1838. His two last letters are from Oeiras, the capital of the province of Piauhy, a district which Dr Von Martius recommended to the investigations of our enthusiastic traveller, as likely to yield a richer harvest of novelty to the botanist, than almost any other part of Brazil; and our expectations have not been disappointed. The valuable collections both of Ceará and Piauhy are already safely arrived, each consisting of upwards of 400 species, in the most perfect state of preservation possible, and they are placed in the hands of Mr W. Pamplin, 9, Queen Street, Soho, London, for the purpose of being distributed to the respective subscribers. There will be a few sets remaining to be disposed of after this distribution, to be had by applying to Mr Pamplin. The whole of Mr Gardner's Brazilian collections now amounts to the number of 2468 species. The following extracts from the two letters just alluded to, will give some idea of the difficulties Mr Gardner has to contend with, and of his great anxiety to further the cause of botany, by adventuring still further, into the provinces of Minas Geraes and Goyaz.)—Ed.

City of Oeiras, (Capital of Piauhy,)
May 20, 1839.

I avail myself of an opportunity of sending letters from this place to Bahia, all communication being cut off, owing to the state of the country between Oeiras and Maranham. You are already informed, that it was my intention to proceed from hence to the Rio Tocantins, a tract of country entirely unknown to the botanist, and then to descend by it to Pará; but I am sorry to say it is somewhat doubtful if this plan can be carried into execution. About the time that I arrived in Oeiras, rumours were afloat that a band of robbers had organized themselves in the neighbourhood of Cachias, a large and flourishing villa situated on the Rio

Itapicura, on the road between this city and Maranham. Since then, every arrival from that quarter brings intelligence of the rapid increase of their numbers and the nature of their designs. A short while ago, a body of about 100 soldiers were sent from Maranham to disperse them, the whole of which by some mismanagement were made prisoners, and their lieutenant-colonel and captain put to the sword. It is but a few days since an express was despatched from Cachias to the Baron de Parnahiba, entreating him to send all the troops to the former place, (and the said troops are sadly few in number and present a most unsoldierly appearance,) at the same time communicating the following alarming news:—These brigands (they call themselves patriots!) are encamped about 100 leagues below Cachias, and are said now to number nearly 2000 men, abundantly supplied with arms and ammunition. Their leader, a man of colour, is reported to be a most blood-thirsty wretch, and only an instrument in the hands of the party opposed to the present government in Maranham. As might be expected, all the vagabonds in the country are hastening to join the rebels, who are expected to make an attack shortly on Cachias, where there are no forces to resist them. In Europe, 2000 men would be considered as nothing, but in these thinly peopled and thickly wooded countries, it will cost much difficulty to get the better of them, especially as there are almost no troops in the north of Brazil, the greater part being occupied in quelling the revolution that has broken out in the province of Rio Grande do Sul. The last post from Cachias to Campo Maior, was made prisoner and all the letters examined; but as he carried no official despatches, he was permitted to proceed. More recently still, a young man, a native of this place, who is established as a merchant in Cachias, was coming up from Maranham in a large canoe, with about £2000-worth of goods, he was made prisoner, and robbed of all his property. He is still, if yet alive, in their hands, but his friends fear the wretches may have destroyed him. Such being the state of the country, I shall wait as long as possible where I

am, and if compelled to remove, shall return to Pernambuco, collecting by the way. I am now engaged packing up my plants, which amount to between 300 and 400 species, many of them very fine things, but how I shall get them to the coast is the difficulty, as they certainly cannot go by way of Maranham. The vegetation about Oeiras is not very varied, but I believe hardly any thing in flower has escaped me. *Leguminosæ* are abundant, but I have found only one orchideous plant—a *Habenaria.* I have collected noble specimens of a large yellow-flowered *Qualea,* which appears to be new, two very small species of *Eriocaulon,* a beautiful new annual *Gloxinia,* and an extremely fine *Anemia.*

It is exactly three years to-day, since I quitted Britain, and I am happy to say that I never enjoyed better health, though the hardships I have encountered exceed any thing that can be imagined by those who have not essayed the same kind of travelling in a similar country. Still, the real delight I feel in forming my collections, and in hearing that they give satisfaction to those for whom they are destined, more than counterbalances the trials I am obliged to undergo. I have also received much kindness from all the respectable inhabitants of the different places I visit, and real friendship from many individuals in this city, where my knowledge of medicine and surgery also enables me to afford some relief to many of my suffering fellow-creatures. Some operations I have lately performed, have brought me no little fame, especially the depressing of a cataract on the eyes of a very respectable shopkeeper who had been blind for twelve months, but is now fast recovering his sight. I had to make the instrument myself, which I did by filing a needle to the proper shape. A few days ago, I also similarly operated on a poor man who has been blind for years, but I cannot yet pronounce on the result.

The rains have now ceased, and the climate at this season is delightful. In a few months again, the heat will be so intense as to burn up every particle of vegetation :—not a vestige of verdure will then be seen.

City of Oeiras, (Capital of Piauhy,)
July 6, 1839.

My last letter, sent by way of Bahia, informed you of the distressing predicament in which I was placed, owing to the revolution which broke out in the province of Maranham, and by which any intercourse with other parts of the country was rendered difficult and uncertain. These disturbances have since increased so much as to compel me to relinquish my plan for investigating Tocantins, the intermediate country being in the hands of the insurgents. This city is now filled with rustic troops, who are undergoing the necessary process of being drilled, preparatory to sending them to the succour of the town of Cachias, a place that for two months has been closely invested by the rebels. The inhabitants are in a state of starvation, and great fears are entertained, lest the rebels, whose numbers now amount to 5000, should force an entrance, and put all the Portuguese inhabitants at least, to the sword. The massacre and extermination of foreigners is one of their articles of war. In the villa of Pastos Bons, of which they are masters, they killed five Portuguese merchants, and one Brazilian.

Had it not been for circumstances which necessarily delayed me here, I should have been myself at the above-mentioned villa, when it fell into the rebels' hands. Till a few days ago, I had intentions of returning to Pernambuco, in company with Don Casimirio José de Morais Sarmiento, a young Brazilian who has shown me much kindness since my arrival here; but I have since changed my mind, and now intend to proceed up through this province to those of Goyaz and Minas Geraes, and from thence descend to Rio de Janeiro. This route cannot be expected to yield me so many novelties as the one by the Tocantins would have done, but it promises better than returning to Pernambuco. The collections I have been making in this district are to go by Don Sarmiento to Pernambuco on one of my own horses, and I expect they will be despatched in about an hour.

Of late I have been much at a loss for want of paper in

which to deposit my dried specimens, but have to-day obtained a supply of old newspapers from a friend here. The pleasures of expeditions such as these are certainly great, but the vexatious difficulties which frequently arise, are enough to drive one mad. Owing to the brief period which has elapsed between my altered plans and Don Sarmiento's departure, I have not yet been able to make an abstract of my journal to send you. I am truly glad that such an opportunity has offered of despatching my collection to the coast, as owing to all communication being cut off between this district and Maranham, it is impossible to divine when they might otherwise have been forwarded; and I can feel no doubt about their now travelling in safety and good condition.

Whenever an opportunity offers of sending to the coast, I shall write from time to time, during my journey from this place to Rio; but I fear that I must be long deprived of the satisfaction of hearing from Britain.

GEORGE GARDNER.

IV.—*Contributions towards a Flora of South America.—Enumeration of Plants collected by* MR SCHOMBURGK *in British Guiana.* By GEORGE BENTHAM, ESQ., F.L.S.

MR SCHOMBURGK in his later journeys into the interior of British Guiana, has added considerably to the catalogue of species already given in Taylor's *Annals of Nat. Hist.* Vol. II., &c. These it is desirable to incorporate with the former list, which will thus constitute a Flora of upwards of 1400 species collected by this distinguished naturalist and traveller amidst his numerous geographical and other important scientific occupations.

COMPOSITÆ.

TRIBE VERNONIACEÆ.

1. Sparganophorus *Vaillanti, Gærtn.—Benth. in Ann. N. Hist.* II. *p.* 107.—Bank of the Courantine and Currasawaak. Schomburgk, n. 154 and 206.

2. Vernonia (Vanillosma,) *opaca* (n. sp.); ramis teretibus petiolisque fulvo-tomentosis, foliis oblongo-ellipticis acuminatis basi angustatis integerrimis coriaceis supra glabris subtus fulvo-tomentosis, capitulis glomeratis sessilibus axillaribus petiolo brevioribus pluri (8—10) floris, achænio trigono glabro, pappis setis subæqualibus.—Serra Mey, Schomburgk, n. 1016.—This species resembles in habit *V. splendens*, Less. *DC. Prodr.* V. *p.* 18, (Gardner's No. 59, and in several other Rio collections); but the leaves are not shining above, and are longer, and the heads of flowers and pappus are different. It is evidently near *V. axillaris, Less.* (*DC.*, *l. c. p.* 19), but there are certainly no short external setæ to the pappus. It differs from *V. isotrichia*, (*DC. l. c. p.* 18), chiefly in the number of flowers in each head. The plant I have received from Martius, (with the No. 199 of his *Herbarium Floræ Brasiliensis*, where (p. 126) that number is given to *V. isotrichia*,) has, it is true, as many as fifteen or twenty flowers to the head; but this plant differs, in so many respects, from De Candolle's character, especially in the pedicellate heads, which bring it near *V. umbellata*, that I presume there was some mistake in the distributing of this number.

3. V. *dichocarpha*, *Less.*—*DC. Prodr.* V. *p.* 23.—Roreima mountain, British Guiana. Schomburgk.

4. V. *odoratissima*, *H. B. K.*—*DC. Prodr.* V. *p.* 38. *Benth. in Ann. N. Hist.* II. *p.* 107.—Rocky places in savannahs on the Rupunoony. Schomburgk, No. 97.

5. V. *scorpioides*, *Pers.*—*DC. Prodr.* V. *p.* 41. *Benth. in Ann. N. Hist.* II. *p.* 107.—British Guiana. Schomburgk, No. 258.

6. V. (*Lepidoploe*, § 3.) *ehretifolia* (n. sp.); herbacea, caule tereti villoso-tomentoso, foliis breviter petiolatis obovato-oblongis acuminatis integerrimis margine revolutis basi longe angustatis subcoriaceis utrinque scabris viridibus subtus puberulis, cymis scorpioideis aphyllis, pedunculis brevibus tomentosis 3—6-cephalis, capitulis circa 15-floris, involucris ovoideis sessilibus squamis acuminatis glabriusculis, achænio pilosiusculo, pappi serie exteriore paleacea brevi.—

Habitus *V. scorpioidis*, affinis quoque ex descriptionibus *V. odoratæ et V. pellitæ.*—Roreima mountain, British Guiana. Schomburgk, n. 1035.

7. V. *tricholepis, DC.—Benth. in Ann. N. Hist.* II. *p.* 107.—British Guiana. Schomburgk, n. 282, and—β. *microcephala*, foliis oblongo-lanceolatis, capitulis parvis. *n.* 149. —distinct?

8. Centratherum *muticum, Less.—Benth. in Ann. Nat. Hist.* II. *p.* 108.—British Guiana. Schomburgk, n. 254.

9. Elephantopus *Carolinianus, Willd.—Benth. in Ann. N. Hist.* II. *p.* 108.—British Guiana. Schomburgk, n. 473, or 413.—Perhaps identical with *E. mollis, nudicaulis and scaber.*

10. Elephantosis *angustifolia, DC.—Benth. in Ann. N. Hist.* II. *p.* 108.—British Guiana. Schomburgk, n. 612.

11. Trichospira *menthoides, H. B. K.—Benth. in Ann. N. Hist.* II. *p.* 108.—On the Currasawaak. Schomburgk.

12. Pectis *elongata, H. B. K.—Benth. in Ann. N. Hist.* II. *p.* 108.—British Guiana. Schomburgk, n. 184 and n. 1003.

Tribe Eupatoriaceæ.

13. Ooclinium *villosum, DC.—Benth. Ann. N. Hist.* II. *p.* 108. British Guiana.—Schomburgk, n. 798. French Guiana.

14. O.? *clavatum* (n. sp.); suffruticosum? caule tereti striato scabriusculo, foliis oppositis distantibus linearibus trinerviis scaberrimis, paniculæ ramis oppositis apice subtrifidis ramulis subtricephalis, capitulis subcylindraceis circiter 20-floris, involucri squamis imbricatis appressis striatis apice obtusis brevissime appendiculatis deciduis, receptaculo obovato-clavato.—*Benth. Ann. N. Hist.* II. *p.* 108.—British Guiana. Schomburgk, n. 165.

15. Eupatorium *subvelutinum, DC.—Benth. Ann. N. Hist.* II. *p.* 108.—Savannahs of the Rupunoony. Schomburgk, n. 76.

16. E. *conyzoides, DC.*, var. foliis subtus glabrioribus. *Benth. Ann. N. Hist.* II. *p.* 108.—Woods of the Paraime Chain. Schomburgk, n. 72.

17. E. *scabrum, Linn. fil.—DC. Prodr.* V. *p.* 148.—Roreima mountain; British Guiana. Schomburgk.

18. E. *subobtusum*, *DC.*—French Guiana.

19. E. *ixodes* (n. sp.); fruticosum, glabrum, viscosum, ramis teretibus, foliis oppositis vel supremis alternis breviter petiolatis oblongis obtusis integerrimis vel hinc inde sinuato-dentatis basi angustatis rigidis penninerviis, paniculæ ramis alternis oppositisque apice corymbosis, capitulis sessilibus pedicellatisque ovatis 25-30 floris, involucri squamis 4-5-seriatis oblongo-linearibus imbricatis dorso subpuberulis intimis apice breviter ciliatis, achæniis ad costas scabridis. *Benth. Ann. N. Hist.* II. *p.* 108.—Savannahs of the Rupunoony. Schomburgk, n. 79.—Near E. *subobtusum.*

20. E. *Schomburgkii* (n. sp.); fruticosum, ramis apice scabris, foliis alternis petiolatis oblongo-lanceolatis acuminatis integerrimis basi longe angustatis glabris penninerviis supra vix scabriusculis, paniculis terminalibus polycephalis ramis rufo-scabris, capitulis pedicellatis 15-20-floris, involucri squamis circa 10 subbiseriatis dorso puberis interioribus parum longioribus apice submembranaceis fimbriato-ciliatis.

Folia 2-4-pollicaria, siccitate nigricantia. Capitula parva numerosa campanulata. Species ex descr. *E. erigeroidi DC. Prodr.* V. *p.* 171. affinis, sed præcipue foliis diversa.—Mountains of Mawacca, near the River Padama. Schomburgk, n. 1014.

21. Mikania *racemulosa* (n. sp.); fruticosa, scandens, ramis teretibus petiolisque pube fusca scabridis, foliis petiolatis late ovatis acuminatis integerrimis basi obtusis, supra scabris subtus subvelutino-pubescentibus irregulariter penninerviis ramorum floralium parvis triplinerviis, panicula composita, racemis oppositis elongatis terminali longiore, pedicellis bracteola duplo longioribus capitulo subæquilongis, involucri squamis oblongo-linearibus apice fimbriatis, achænio glanduloso. *Benth. Ann. N. Hist.* II. *p.* 109.—British Guiana. Schomburgk, n. 480.

22. M. *Hookeriana*, *DC.*—British Guiana. Schomburgk, n. 479.

23. M. *denticulata*, *DC.*—British Guiana. Schomburgk, n. 321.

24. M. *convolvulacea, DC.*—British Guiana. Schomburgk, n. 93.

25. M. *Parkeriana, DC.*—British Guiana. Schomburgk, n. 310.

Tribe Asteroideæ.

26. Baccharis *leptocephala, DC.*—British Guiana. Schomburgk, n. 129.

27. Pterocaulon *spicatum, DC. Prodr.* V. *p.* 454.—Baccharis erioptera, *Benth. in Ann. Nat. Hist.* II. *p.* 441.—Dry savannahs of the Upper Rupunoony. Schomburgk, n. 709.

28. Eclipta *erecta, Linn.*—British Guiana. Schomburgk, n. 331.

Tribe Senecionideæ.

29. Riencourtia *glomerata,* Cass.—French Guiana.

30. Latreillea *glabrata* (n. sp.); caulibus glabris subramosis, foliis lanceolatis obscure dentatis integerrimisque, petiolis brevissimis supremis subciliatis, involucri squamis latissime obovatis paleisque receptaculi obtusis brevissime fimbriatis glabris. *Benth. Ann. N. Hist.* II. *p.* 109.—Dry savannahs British Guiana. Schomburgk, n. 247, and n. 867; not *Broteroa trinervata,* as erroneously stated in *DC. Prodr.* I. *p.* 293.

A full description of this plant, and character of two new Brazilian species, are given at v. II. p. 109 of the *Annals of Natural History.*

31. Clibadium *asperum, DC.*—British Guiana. Schomburgk, n. 658, and n. 1005. French Guiana. Leprieur.

32. C. *erosum, DC.*—British Guiana. Schomburgk, n. 294.

33. Unxia *camphorata, Linn. fil.*—Dry savannahs of the Rupunoony. Schomburgk, n. 380.

34. U. *hirsuta,* Rich.—French Guiana, Leprieur.

35. Acanthospermum *xanthioides, DC.*—British Guiana. Schomburgk, n. 663.

36. Wedelia *hispida, H. B. K.—DC. Prodr.* V. *p.* 539. Swampy and stony places about Annay-y, British Guiana. Schomburgk, n. 812.—Chorillo Bay, Peru. Macrae.

37. W. *scaberrima* (n. sp.); caule fruticoso, ramis divaricatis hispidis, foliis petiolatis ovatis acuminatis serratis, basi obtusis, supra scaberrimis hispidis, subtus scabro-pubescentibus triplinerviis, pedicellis 1-3 axillaribus terminalibusque folio brevioribus monocephalis hispidis, involucri squamis exterioribus ovali-oblongis extus hispidis, interioribus subæquilongis obovato-obtusis ciliatis, ligulis 6-8 bifidis, achænio puberulo calyculo subbicorni fimbriato-ciliato. *Benth. Ann. N. Hist.* II. *p.* 110.—Skirts of woods, British Guiana. Schomburgk, n. 128.

38. W. *discoidea*, *Less.*—British Guiana. Schomburgk, n. 650.

39. Wulfia *platyglossa*, *DC. Prodr.* V. *p.* 563?—Tilesia capitata. *Mey. Prim. Fl. Esseq.* 252. *DC. Prodr.* V. *p.* 549.—Dry savannahs, British Guiana. Schomburgk, n. 185 and 705.

40. Bidens *bipinnata*, *Linn.*—British Guiana. Schomburgk, n. 455.

41. Cosmos *caudatus*, *H. B. K.*—French Guiana.

42. Lipochæte *scaberrima* (n. sp.); fruticulosa? ramis scabris, foliis breviter petiolatis ovato-lanceolatis acutis basi cuneatis remote subserratis utrinque scaberrimis penninerviis, capitulis plurimis laxe corymbosis, involucri ovati squamis exterioribus obtusiusculis interioribus acutis disco brevioribus. Affinis ex descr. L. *umbellatæ*, *DC. Prodr.* V. *p.* 610. Folia 2-3 pollicaria opposita, achænia radii trigona triaristata, arista altera achænio subæquilonga, duabus brevissimis; disci compressa oblonga inæqualiter biaristata et inter aristis squamellis pluribus brevissimis aucta, ut in *Leighia* et *Viguiera*. Ab his vero generibus plane differt ligulis fertilibus.—A single specimen from the Roraima mountain. Schomburgk.

43. Verbesina *helianthoides*. *H. B. K.*—*DC. Prodr.* V. *p.* 613.—A single specimen from the Pacaraima chain. Schomburgk. Organ mountains, Brazil. Gardner, n. 508.

44. Spilanthes *Pöppigii*, *DC. Prodr.* V. *p.* 622?—Abandoned fields, British Guiana. Schomburgk, n. 890. A Brazil-

ian plant answering to the character of *S. Lundii, DC.* appears scarcely different from this one, which is probably not an uncommon and a variable plant, published under different names from different parts of S. America.

45. Porophyllam *latifolium* (n. sp.); herbaceum, erectum, foliis longe petiolatis lato-ovatis obtusis grosse sinuatis ad sinus pellucido-glandulosis, involucri squamis mucrone calloso acuminatis. *Benth. Ann. N. Hist.* II. *p.* 441.—Dry savannahs on the Upper Rupunoony. Schomburgk.

46. Calea *divaricata* (n. sp.); fruticosa divaricato-ramosa, ramulis angulatis canescentibus, foliis breviter petiolatis ovatis obtusissimis integerrimis subcrenatisve uninervibus vel obscure trinervatis crassiusculis glabris, pedunculis brevibus in ramulos breves axillares solitariis monocephalis, involucri ovoidei imbricati squamis exterioribus brevibus lato-ovatis interioribus oblongis obtusis omnibus glabris, ligulis pluribus, paleis receptaculi acutiusculis, pappi paleis achænio hirsuto dimidio brevioribus.—Frutex 8—10-pedalis, diffusus. Folia vix semipollicaria aromatica. Pedunculi folia parum superant. Flores radii et disci lutei odorati.—Near the Roraima mountain. Schomburgk.

47. Geissopappus *caleoides.*—Schomburgkia caleoides. *DC. Prodr.* VII. *p.* 294. *Coll. Mem.* IX. *p.* 28. *t.* 9.—British Guiana. Schomburgk, n. 474.

A short time before the publication of the seventh volume of the *Prodomus*, a fine Orchidaceous genus, was dedicated to Mr Schomburgk, by Lindley in the second part of his *Sertum Orchidaceum*. It has become therefore necessary to change De Candolle's name for the present plant, and I have derived that of *Geissopappus* from the overlapping paleæ of the pappus.

48. Achyrocline *flaccida, DC. Prodr.* V. *p.* 220.—The specimens are precisely similar to those of Salzmann from Bahia. Woods near the Roraima. Schomburgk, n. 1042.

49. Gnaphalium *Americanum, Mill.*—British Guiana. Schomburgk, n. 573.

Tribe Mutisiaceæ.

50. Leria *nutans, DC. Prodr.* VII. *p.* 42.—British Guiana. Schomburgk, n. 689.

GENTIANEÆ.

51. Schultesia *stenophylla, Mart. Nov. Gen. et Sp.* II. *p.* 106. *t.* 182. *Griseb. Gent.* 126.—Moist savannahs, British Guiana. Schomburgk.

52. S. *brachyptera, Cham.*—British Guiana. Schomburgk, n. 789.

53. Coutoubea *spicata. Aubl. Pl. Guian.* I. *p.* 72. *t.* 27.—Banks of the Rupunoony. Schomburgk, n. 152.

54. C. *reflexa,* (n. sp.); caule herbaceo annuo stricto ramoso teretiusculo, foliis lanceolatis acutis basi angustatis margine revolutis, spicis axillaribus terminalibusque, floribus oppositis distantibus, corollæ laciniis reflexis.—Moist savannahs, British Guiana. Schomburgk.

55. C. *ramosa, Aubl. Pl. Guian.* I. *p.* 74. *t.* 28. *Griseb. Gent. p.* 132.—Sands, British Guiana. Schomburgk, n. 989. This is certainly an herbaceous annual; not shrubby, as supposed by Grisebach.

56. Schuebleria *tenella, Mart. Nov. Gen.* II. *p.* 117.—French Guiana.

57. S. *coarctata* (n. sp.); caule filiformi subsimplici, foliis oppositis linearibus, cyma coarctata, corollæ flavescentis calycem dimidio superantis lobis oblique ovatis acutis tubum subæquantibus, stigmate lineari-clavato.—Arid savannahs on the Rupunoony. Schomburgk, n. 167.

58. Lisianthus (Chelonanthus) *breviflorus* (n. sp.); caule herbaceo ramoso subtetragono, foliis petiolatis ovatis acutis basi inferioribus angustatis superioribus rotundatis, omnibus membranaceis remote penninerviis, cyma pauciflora semel dichotoma, corollæ (semipollicaris) tubo vix calyce longiore fauce late campanulata lobis lato-ovatis obtusis, genitalibus corollam non excedentibus.—*Folia* 1—2 pollicaria, tenuia, concoloria, superiora breviora ovato-lanceolata suprema, ut

in cæteris speciebus hujus sectionis, minima remota.' *Umbellæ* v. *cymæ* sub-5-floræ. *Flores* cærulei latiores quam longi.—Serra Mey. Schomburgk. A single specimen.

59. L. *gracilis, Griseb. Gent. p.* 182? or a species closely allied to it. There is, however, but a single specimen from Marawaica in Schomburgk's collection, and that has but one expanded flower. It answers well to Grisebach's description, except that the style is scarcely exserted.

60. L. *uliginosus, β. Guianensis. Griseb. Gent. p.* 182.—Moist savannahs, British Guiana. Schomburgk, n. 265. "Flowers light blue."

61. L. *chelonoides, Linn.*—British Guiana. Schomburgk.

62. Tolbachia *cærulescens, Griseb. Gent. p.* 195.—Lisianthus cærulescens, *Aubl. Pl. Guian.* I. *p.* 207. *t.* 82. *Mart. Nov. Gen. et Sp.* II. *p.* 99. *t.* 178. *fig.* 2.—Moist savannahs, British Guiana. Schomburgk, n. 164.

63. Voyria *uniflora, Lam.*—*Griseb. Gent. p.* 207.—On rotten wood in the Serra Mey. Schomburgk.

64. V. (Leta) *acuminata* (n. sp.); caule brevi ramoso, corollæ albidæ lobis ovato-lanceolatis longe acuminatis, ventriculo tubi ovoideo-oblongo.—Habitus *V. rosea, Aubl.*, a qua differt dentibus calycinus acutioribus et præcipue corollæ lobis longioribus in acumine fere filiformi productis.—In rich vegetable soil, on the wayside in shady woods, in the Serra Parima. Schomburgk.

65. Limnanthemum *Humboldtianum, Griseb. Gent. p.* 347.—British Guiana, Schomburgk, n. 826; also in the province of Ceará, Brazil. *Gardner, n.* 1763.

SCROPHULARIACEÆ.

66. Angelonia *salicariæfolia, Humb. et Bonpl. Pl. Æquin.* II. *p.* 92. *t.* 108.—Moist savannahs, British Guiana. Schomburgk.

67. Stemodia *foliosa* (n. sp.); annua erecta villosa, foliis breviter petiolatis ovato-lanceolatis oblongisve vel infimis ovatis serrato-crenatis basi cuneatis utrinque asperis subvillosis, floribus axillaribus breviter pedicellatis in racemos inter-

ruptos foliosos axillares terminalesque irregulariter dispositis.—*Caulis* bipedalis, teres v. obscure angulatus, pube viscosa et pilis longiusculis patentibus villosus, ramosus nunc ramosissimus. *Folia* opposita v. 3—4-natim verticillata, 1—3 pollicaria, internodiis sæpe longiora, rugosa et plus minusve viscosa, suprema et ramulorum floralium brevia, sæpe ovata. *Pedicelli* 1—3 lin. longi, axillares et solitarii, sed ramulis floralibus interdum brevissimis ex eadem axilla prodeuntibus nonnunquam fasciculum seu pseudo-verticillum formant. *Sepala* anguste lanceolata, subulato-acuminata. *Corolla* cærulea, subpurpurascens, glabra, tubo calyce incluso, labio inferiore duplo longiore.—Savannahs, British Guiana. Schomburgk.—Tropical Brazil, Pohl.—Bahia, Saltzmann, Lhotsky. Gardner, n. 898.—Pernambuco, Gardner, n. 1093.—Gardner's n. 1088, from Pernambuco, and Blanchet's n. 2562, from the Serra Jacobina, are the *Stemodia maritima, Linn.* —Gardner's n. 89, and Tweedie's n. 1172 and 1173, are *S. trifoliata, Reich.*, a common Rio Janeiro plant.—Gardner's n. 1092, from Pernambuco, and 1378 from Alagoas, are *S. verticillata, Link.;* the same collector's n. 1803, from Ceará, appears to be a new *Stemodia.*

68. Bacopa *aquatica. Aubl.*—Herpestes stellarioides, *β.* —*Benth. in Hook. Comp. Bot. Mag.* II. *p.* 57.—Swampy situations on the Essequibo and Rupunoony. Schomburgk, n. 532.

BACOPA.

Gen. Char. *Calyx* 5-partitus sepalis imbricativis, postico maximo foliaceo, 2 anticis pariter foliaceis et minoribus, 2 lateralibus interioribus lineari-carinatis. *Corolla* subrotata v. campanulata, æqualiter 5-fida, æstivatione imbricativa. *Stamina* 5 æqualia, laciniis corollinis alternantia. *Antheræ* lineari-sagittatæ, biloculares, loculis subparallelis rima longitudinali dehiscentibus. *Ovarium* biloculare. *Stylus* simplex. *Stigma* bilamellatum. *Capsula* membranacea, vix dehiscens, bilocularis, dissepimento membranaceo fere per totam superficiem placentifero. *Semina* numerosissima, horizontalia, oblongo-ovoidea, acuminata, testa reticulata; albumine copioso,

embryone crassiusculo recto; radicula ad hilum spectante.—Herbæ *Americæ tropicæ, paludosæ, glabræ.* Herpestidibus *pluribus sectionis* Bramiæ *similes.* Folia *opposita.* Pedunculi *axillares, solitarii vel fasciculati, uniflori, bracteis* 2 *setaceis aucti.* Corollæ *cærulescentes vel albæ.*

1. B. *aquatica*, (*Aubl.*); foliis lanceolatis, bracteis a calyce remotis, sepalis exterioribus in pedunculum subdecurrentibus, corollæ calycem subdimidio superantis laciniis ovali-oblongis.

2. B. *grandiflora* (*Mart.*); foliis lanceolatis, bracteis calyci approximatis, sepalo postico basi cordato, corollæ calycem duplo superantis laciniis late obovatis.—Near Alegre in the province of Lower Piauhy. Martius.

69. Herpestes *chamædrifolia, Humb. and Kunth, Nov. Gen.* II. *p.* 369.—Barcellos on the Rio Negro. Schomburgk.

70. H. *gratioloides, Benth. Comp. Bot. Mag.* II. *p.* 57.—Caconapea gratioloides, *Cham. et Schl. Linnæa,* VIII. *p.* 29. Skirts of the Pacaraima mountains. Schomburgk, n. 1033.

71. H. *sessiliflora, Benth. in Hook. Comp. Bot. Mag.* II. *p.* 58.—French Guiana.

(Mecardonia *pusilla, Mart. Nov. Gen. et Sp.* III. *p.* 16. *t.* 208. has all the characters of the first section of *Herpestes*, and belongs to *H. serpylloides*, (*Cham. et Schl.*)—Gardner's n. 1799, from Ceará, is a new species of the section *Caconapea;* his No. 1089, from Pernambuco, is *Herpestes stricta* (*Schrad.*), to which is to be referred my *H. polyantha;* his n. 214, from Rio Janeiro, is the *H. lanigera*, (*Cham. et Schl.*), and 181, is *H. Monniera.* The same collector's numbers 1090, and 1091, from Pernambuco, and 1797, from Ceará, appear to be so many new species of the section *Bramia.*)

72. Beyrichia *ocymoides, Linnæa,* III. *p.* 21.—Sands of the Essequibo and Rupunoony. Schomburgk, n. 528.

73. Conobea *aquatica, Aubl. Guian. p.* 639. *t.* 258.—Demerara and French Guiana.

74. Vandellia *crustacea, Benth. Scroph. Ind. p.* 35.—French Guiana.

75. V. *diffusa, Linn.*—Borders of the Essequibo and Rupunoony. Schomburgk, n. 516.—" Flowers white, with

a tinge of rose."—It is Sieber's n. 305, from Martinico, and n. 170, from Trinidad; Gardner's n. 1097, from Pernambuco, and is also found in Bahia.

76. Torenia *parviflora, Benth. Scroph. Ind. p.* 39.—Rich soil near rivers, in British Guiana; Schomburgk's n. 335; Gardner's n. 213, from Rio Janeiro.—The three above genera are East Indian, where the species *Vandellia crustacea*, and *Torenia parviflora*, are also common.

77. Buchnera *palustris, Spreng.—Benth. in Hook. Comp. Bot. Mag.* I. *p.* 365.—Moist savannahs, British Guiana. Schomburgk, n. 419.

78. B. *lavandulacea, Linnæa,* II. *p.* 589.—Dry savannahs among rocks, British Guiana. Schomburgk, n. 99.—Also Cuming's n. 1100, from Panama, and perhaps identical with *B. longifolia* or *B. lithospermifolia*, H. B. K.

79. Scoparia *dulcis, Linn.*—British Guiana. Schomburgk, n. 622.—Also Gardner's n. 90, from Rio Janeiro; Cuming's n. 1000, from Lima, and common in tropical America and West Indies.

80. Escobedia *scabrifolia, Ruiz et Pav. Syst. Veg. p.* 158. Paraime mountains. Schomburgk.

81. Gerardia *hispidula, Mart. Nov. Gen. et Sp.* III. *p.* 13. *t.* 207. *Benth. in Hook. Comp. Bot. Mag.* I. *p.* 207.—Sandy swamps, British Guiana. Schomburgk, n. 674.—French Guiana.—"Whole plant purplish, calyx deep purpe, and corolla whitish purple."

82. Glossostyles *aspera, Linnæa,* III. *p.* 22. *Benth. l. c. p.* 212.—French Guiana.

LABIATÆ.

83. *Hyptis* (Plagiotis) *laciniata* (n. sp.); annua, erecta, puberula, foliis pinnatisectis laciniis linearibus inciso-dentatis, capitulis axillaribus pedunculatis semiglobosis dense multifloris, bracteis ovatis, calycibus apice incurvis, ore obliquo acute et inæqualiter dentato.—Species foliis dissectis distinctissima! cæterum *H. uliginosæ* affinis. Caulis erectus, semipedalis, læviter cano-pubescens. Folia pollicaria, inter-

dum fere bipinnatisecta, supra glabriuscula, subtus cano-puberula. Pedunculi folio longiores, tenues, rigidi. Capitulum 4 lin. diametro. Bracteæ calyces æquantes, acutiusculæ, ciliatæ; calyx fructifer membranaceus, $1\frac{1}{2}$ lin. longus, basi subinflatus, supra medium parum contractus et incurvus, ore valde obliquo, dentibus brevibus 3 superioribus lanceolatis, 2 infimis minimis, omnibus subulato-acuminatis. Corolla calycem floriferum paullo superans, 1 lin. longa, apice extus pilosa, forma limbi omnino *Hyptidum*. Carpella oblonga.—Dry savannahs, near the Pacaraima mountains. Schomburgk.—It is much to be regretted that there should not have been specimens enough for general distribution of this, the only species known in this extensive genus with dissected leaves.

84. H. *recurvata, Poit.—Benth. Lab. Gen. et Sp. p.* 81.—Sands of the Essequibo, British Guiana. Schomburgk, n. 605.

85. H. *paludosa, St. Hil.—Benth. l. c. p.* 82.—Moist savannahs, British Guiana. Schomburgk, n. 686.

86. H. *sp. nova, H. crenatæ* affinis et foliorum forma diversa.—Tonpaeging mountains, near the Rio Negro. Schomburgk, n. 1029.—My specimens are unfortunately too young to enable me to give a specific character of this plant.

87. H. *lantanæfolia, Poit.—Benth. l. c. p.* 101.—British Guiana. Schomburgk, n. 686.

88. H. *brevipes, Poit.—var. β. Benth. l. c. p.* 105; forma capitulis majoribus subsessilibus.—Moist savannahs, Upper Rupunoony. Schomburgk.

89. H. *Parkeri, Benth. l. c. p.* 108.—Sands of the Essequibo, British Guiana. Schomburgk, n. 598.

90. H. *spicata, Poit.—Benth. Lab. p.* 120.—Abandoned village of St José, on the borders of British Guiana. Schomburgk, n. 1006.

91. H. *pectinata, Poit.—Benth. l. c. p.* 127.—French Guiana.

92. H. *membranacea, Benth. Lab. p.* 132.—Woods near Roreima. Schomburgk, n. 1034.—" This is a tree, twenty

feet or more high, of great beauty from the abundance of its flowers, and the mixture of the pink on its floral leaves and calyces contrasting with the blue of the corolla." Schomburgk.

93. H. *simplex, St. Hil.—Benth. Lab. p.* 138 ?—Savannahs skirting the Pacaraima mountains. Schomburgk.—The absence of corollas on the few specimens before me, makes me uncertain of the species.

94. Marsypianthus *hyptoides, Mart.—Benth. l. c. p.* 64.—British Guiana. Schomburgk, n. 215.

VERBENACEÆ.

Tribe Verbeneæ.

This Order has been divided respectively by Bartling and Endlicher into two and three tribes. The former arrangement is the most natural, though it requires some modification.

The first tribe, or *Verbeneæ*, are closely allied to *Labiatæ*, but characterized by their simple spicate inflorescence and ovules, which are straight, anatropous and erect from the base of the cells. They are herbaceous or subshrubby, seldom, if ever arborescent. Leaves often divided, never compound; calyx herbaceous or membranaceous, not materially extended after the fall of the corolla. Cells of the ovary often diverging at the base, especially during the growth of the fruit, so as to leave between them a space, either empty in the dry fruited genera, or filled with pulp in the succulent ones, which space has been described as two additional empty cells. The *Verbeneæ* would comprehend, among the genera with a bilocular ovary; *Spielmannia*, with axillary solitary flowers: *Cryptocalyx*, *Lippia*, *Riedelia*, *Dipterocalyx*, *Lantana*, and *Camara*, with imbricate capitate flowers; and *Aloysia*, *Bouchea*, and *Stachytarpheta*, with spicate flowers. Of the genera with a quadrilocular ovary, it would contain *Verbena*, *Dipyrena*, *Chascanum*, *Tamonea*, *Priva*, *Casselia*, *Monochilus*, (?) and *Chloanthes*.

95. Cryptocalyx *nepetæfolia*, (n. sp.)—British Guiana.

Schomburgk, n. 694.—Also from Trinidad, Anderson; and from Pernambuco, Gardner, n. 1049.—The following are the characters I propose for this new genus and species.

CRYPTOCALYX. *Cal.* membranaceus, tenuissimus, obsolete dentatus. *Cor.* tubulosa, bilabiata, labiis erectis, sup. brevissimo bifido, inf. elongato, trifido. *Stam.* 4. didynama, inf. longiora, omnia antherifera, antheris oblongis bilocularibus. *Ovar.* biloculare, loculis uniovulatis, ovulis a basi loculi erectis anatropis. *Stylus* inclusus. *Stig.* obliquum capitatum. *Fruct.* sponte bipartitus, pericarpio calyceque subevanidis, pyrenis oblongis monospermis. *Sem.* testa duriuscula tenui exalbuminosa; embryone recto; cotyledonibus magnis.

C. *nepetæfolia.* Herba annua, ramosa, basi procumbens sæpe radicans, apice adscendens. Rami crassiusculi, obscure tetragoni, glabri vel pilis appressis paucis onusti. Folia opposita, petiolata, ovato-rhombea, grosse dentata, basi cuneato-truncata et integerrima, 1-1½ pollicaria, utrinque viridia et glabra vel pilis appressis paucis pubescentia. Spicæ ovoideo-oblongæ, axillares, pedunculatæ, solitariæ vel glomeratæ, petiolo breviores. Flores numerosissimi, minuti, sessiles, seriebus circiter 12 densissime imbricati. Rachis post flores delapsos cicatrizata. Bracteæ cuneatæ, acuminatæ, membranaceæ, complicato-carinatæ, margine ciliatæ, flores parum excedentes, calyx corollæ tubo dimidio brevior, sub lente minutissime pubescens. Corolla alba, glabra, vix ultra semilineam longa. Pyrenes maturitate omnino liberi, graniformes, ⅓ lin. longi.—An old plant in herbaria, but not described among *Verbenaceæ;* its habit rather resembling *Compositæ.*

96. Lippia *microphylla, Linnæa,* VII. *p.* 226.—Stony places in savannahs. British Guiana. Schomburgk, n. 75. —For the characters and affinities of this genus, see Chamisso and Schlechtendal, in the *Linnæa* above quoted, and *Mr Bentham's* remarks, in *Taylor's Annals of Natural History, v.* II. *p.* 446.

97. L. *salviæfolia, Jacq. Hort. Schönbr.* III. *p.* 18. *t.* 285? —British Guiana. Schomburgk, n. 730.

98. L. *annua*, L.?—British Guiana. Schomburgk, n. 207.—For remarks on *Lantana*, see *Mr Bentham's* paper in *Taylor's Annals of Natural History*, v. II. *p.* 447.

99. Camara *tiliæfolia*.—*Lantana*, *Linnæa*, VII. *p.* 122.—British Guiana. Schomburgk, n. 196.—The character of *Camara* lies in the fruit, as detailed (*l. c.*)

100. Stachytarpheta *elatior*, *Schrad.*—*Reich. Ic. Ex. t.* 59.—Swamps of the Upper Rupunoony. Schomburgk, n. 1001.

101. S. *Cajanensis*, *Vahl.*—British Guiana. Schomburgk, n. 262 and 888.—Also from Trinidad, and both agreeing in main points with *Vahl's* descriptions.—The affinities of *Stachytarpheta* are fully defined (*l. c.*)

102. S. *mutabilis*, *Vahl*, *Enum.* I. *p.* 209, *var.*? bracteis angustioribus.—British Guiana. Schomburgk, n. 831.

103. Tamonea *spicata*, *Aubl. Pl. Guian.* II. *p.* 660. *t.* 268.—British Guiana. Schomburgk. French Guiana.—Bahia. Gardner, n. 899, and Blanchet, n. 2566.

Tribe Duranteæ. (*vid. Benth. l. c.*)

104. Petræa *macrostachya* (n. sp.); arborea, foliis ovali-ellipticis breviter acuminatis scaberrimis, racemo elongato, pedicellis fructiferis tubo calycis brevioribus, calycis laciniis lineari-oblongis subspathulatis acuminatis aristulatis.—Folia semipedalia. Racemus 1½—2-pedalis, pendulus. Calyces florigeri subsessiles, longiores et tenuiores quam in plerisque speciebus.—On the brook Currassawaak, British Guiana. Schomburgk, n. 158.—Besides *Petræa*, the *Duranteæ* comprehend *Citharexylum*, *Duranta*, and *Pœppigia* (*Bert.*)

Tribe Viticeæ. (*vid. Benth. l. c.*)

105. Pyrostoma *ternatum*, *Mey. Fl. Esseq. p.* 219.—British Guiana. Anderson.

106. Vitex *capitata*, *Vahl*, *Ecl.* II. *p.* 50. *t.* 18. *var.*—British Guiana. Schomburgk.—Specimens from Trinidad coincide with Vahl's description and figure.

107. V. *umbrosa*, *Sw. Fl. Ind. Occ.*—On the Essequibo, Schomburgk.

108. Ægiphila *arborescens, Willd.—Manabea, Aubl. Pl. Guian.* I. *p.* 64. *t.* 24.—Savannahs, British Guiana. Schomburgk, n. 404.

109. *Æ. laxiflora* (n. sp.); frutescens, glaberrima, foliis brevissime petiolatis ovali-ellipticis obtuse acuminatis basi angustatis, paniculis laxis terminalibus basi foliatis, calycis limbo ampliato breviter quadrifido, corollæ infundibuliformis tubo calyce plus duplo longiore.—British Guiana. Schomburgk, n. 772.—Near *Æ. elata*, Swartz.

110. *Æ. salutaris, H. B. K.*—British Guiana. Schomburgk.—For remarks on this genus, see Chamisso and Schlechtendal in the *Linnæa.*

111. *Æ. mollis, H. B. K. Nov. Gen. et Sp.* II. *p.* 203. *t.* 130.—British Guiana. Schomburgk, n. 981.

112. Clerodendron *fragrans, Vent. Malm. t.* 70.—"Sandy soil by the sides of hills, British Guiana." Schomburgk.—Perhaps an erroneous locality, all the flowers being double and sterile, and the plant itself not native in America.

Tribe Avicennieæ. (*vid. Benth. l. c.*)

113. Amasonia *erecta, Linn. fil. Suppl. p.* 294.—*Taligalea campestris, Aubl. Pl. Guian.* II. *p.* 625, *t.* 252.—*Amasonia punicea, Vahl, Ecl.* II. *p.* 51.—Savannahs of the Rupunoony. Schomburgk, n. 228.—A somewhat variable plant, and the specimens too much pressed to show whether the ovary be 2 or 4-celled.

LEGUMINOSÆ.

Tribe Loteæ, *DC.*

Subtribe Genisteæ, *DC.*

114. Crotalaria *stipularia, Desv.—C. Espadilla, H. B. K.*—Savannahs, British Guiana. Schomburgk, n. 62.—French Guiana.—Gardner, n. 959.

115. C. *genistella, H. B. K.*—C. *pterocaula, Desv.*—Moist savannahs of the Rupunoony, British Guiana. Schomburgk.—Peru. Mathews, n. 1935.

For an enumeration of Brazilian *Crotalariæ* belonging to

the groups *Alatæ* and *Erectæ*, see Bentham in *Taylor's Annals of Natural History*, v. III. *p.* 428–9.

116. C. *anagyroides*, *H. B. K.*—Rio Branco. Schomburgk.

117. C. *leptophylla*, *Benth. in Ann. N. Hist.* III. *p.* 430.—Savannahs of the Rupunoony. Schomburgk, n. 788. Rio Preto, Brazil. Pohl.

Subtribe Indigofereæ.

118. Indigofera *pascuorum*, *Benth. in Ann. N. Hist.* III. *p.* 431.—British Guiana. Schomburgk, n. 96.

Subtribe Galegeæ. *DC.*

119. Tephrosia *toxicaria*, *Pers.*—Dry savannahs on the Rupunoony, where it is called "*Yarro conalli*," and used for poisoning the fish "Yarro," which will not eat the "Hiarry." Schomburgk, n. 173. Panama. Cuming, n. 1170.

120. T. *penicillata*, *Benth. in Ann. Nat. Hist. v.* III. *p.* 431.—Near the brook Akalaurie, on the Upper Rupunoony. Schomburgk, n. 678.

121. T. (*Brissonia ?*) *brevipes*, *Benth. l. c. p.* 432.—Savannahs about Annay-y. Schomburgk, n. 66.

122. Sabinea *florida*, *DC. Prodr.* II. *p.* 263.—Dry savannahs, British Guiana. Schomburgk.

123. Lonchocarpus ? *floribundus*, *Benth. l. c. p.* 432.—British Guiana. Schomburgk, n. 238.

124. L.? *rufescens*, *Benth. l. c. p.* 432.—British Guiana. Schomburgk, n. 745.

125. L.? *densiflorus*, *Benth. l. c. p.* 433.—Banks of the Upper Essequibo, where the pounded stem is used for poisoning fish, under the name of "Bastard Hiarry." Schomburgk, n. 52.—The affinities of this genus, which though containing many species is but imperfectly known, are fully explained (*l. c. p.* 433.)

Tribe Hedysareæ. *DC.*

126. Æschynomene *sensitiva*, *L.*—British Guiana. Schomburgk, n. 603.

127. Æ. *ciliata, Vogel, Linnæa,* XII. *p.* 84.—Pedrero on the Rio Negro. Schomburgk, n. 875.—Bahia, Saltzmann.—This species has a wide range in Brazil; it is probably the *Æ. honesta,* (*Nees et Mart.—DC. Prodr.* II. *p.* 322), and is scarcely distinguishable from the North American *Æ. hispida.*

128. Æ. (*Ochopodium*) *interrupta* (n. sp.); frutescens, ramis glabris v. vix scabro-hirtis, stipulis parvis lanceolatis acuminatis, foliolis 6—8 jugis anguste obovato-oblongis obtusis mucronatis glabris, racemis terminalibus v. axillaribus folium subæquantibus, rachi scabra, calycibus glabris, leguminibus longiuscule stipitatis glabris membranaceis, articulis 2—3 latiusculis sinu lato profundo separatis.—Rio Branco. Schomburgk, n. 803.

129. *Æ. paniculata, Willd.—Vogel, Linnæa,* XII. *p.* 95.—British Guiana. Schomburgk, n. 181.

130. Æ. (*Ochopodium*) *densiflora* (n. sp.); herbacea v. suffruticosa erecta, ramis piloso-hispidis et dense puberulis, stipulis lanceolato-subulatis, foliolis 10—15 jugis confertis oblongo-ellipticis obtusis mucronulatis puberulis ciliatis, racemis brevissimis, floribus pluribus confertis, calycibus pilosis bracteisque minimis, leguminibus breviter stipitatis pubescentibus articulis 2 profundissime partitis.—Folia 1—1½ poll., foliola 2—3 lin. longa.—Dry savannahs, British Guiana. Schomburgk, n. 846.

131. Æ. (*Ochopodium*) *mucronulata* (n. sp.); herbacea, procumbens, caulibus gracilibus ramosis læviter pubescentibus, stipulis e basi lata obliquis glabriusculis, racemis plurifloris folia subæquantibus pubescentibus, leguminibus breviter stipitatis subglabris, articulis 2 profundissime partitis.—Folia ½—¾ poll., foliola vix 2 lin. longa.—Dry savannahs, British Guiana. Schomburgk, n. 822.

132. Æ. (*Ochopodium*) *conferta, Benth. l. c. p.* 433.—British Guiana. Schomburgk, n. 187.

133. *Æ. hystrix, Poir.*—French Guiana.

134. *Æ. paucijuga, DC.*—French Guiana.

135. Zornia *reticulata, Sm.*—Arid savannahs of the south

chain of the Conocon Mountains, British Guiana. Schomburgk.

136. Z. *latifolia, DC.*—British Guiana. Schomburgk, n. 257.

137. Stylosanthes *gracilis, H. B. K.*—Dry savannahs, British Guiana. Schomburgk, n. 240.

138. S. *Guianensis, Sw.*—French Guiana.

139. S. *viscosa, Sw.*—Savannahs, British Guiana. Schomburgk, n. 178 or 278.

140. S. *angustifolia, Vogel.*—French Guiana.

141. Nicholsonia *Cayennensis, DC.*—British Guiana. Schomburgk, n. 19.—French Guiana.—Perhaps, like *N. venustata*, only a variety of *N. barbata*.

142. Desmodium *pachyrrhizum, Vogel.*—British Guiana. Schomburgk, n. 657.

143. D. *elatum, H. B. K.*—British Guiana. Schomburgk. Gardner's n. 971 from Pernambuco, though less hairy, appears the same.

144. D. *asperum, Desv.*—French Guiana.

145. D. *rubiginosum, Benth. l. c. p.* 434.—Near *D. asperum*, but distinct. British Guiana. Schomburgk, n. 217.

146. D. *ancistrocarpum, DC.*—Slightly different from *D. incanum.*—French Guiana and Brazil.

147. D. *cajanæfolium, DC.*—*Hedysarum, H. B. K. Nov. Gen. et Sp.* VI. *p.* 525, *t.* 598. var. ?—British Guiana. Schomburgk, n. 648.

148. *Clitoria Poitæi, DC.*—British Guiana. Schomburgk. Panama or Western Columbia. *Cuming, n.* 1141.

Gardner's n. 1551, from Ceará, is a variety of *Clitoria laurifolia*, Poit., or perhaps a species differing from it only in the greater length of the peduncles and the membranous stipules. Both are remarkable from the close resemblance of their foliage and flowers with those of *Neurocarpum cajanæfolium*, from which they are scarcely to be known but by the nerveless pods.

149. Neurocarpum *longifolium, Mart. in Benth. Ann. Mus. Vind.* II. *p.* 116. var.—*N. frigidulum, ejusd., l. c.*—British

Guiana. Schomburgk, n. 58. (fruit specimens, 1839.)—The above two plants are but varieties of each other: the species has an extensive range from the Essequibo to the Minas Geraes in Brazil.

150. N. *cajanæfolium*, *Presl, Symb. Bot. p.* XVII. *t.* 9.—Savannahs at Anna-y. Schomburgk, n. 58. (flowering specimens, 1839).—Common from the Spanish Main to Rio Janeiro. Pernambuco. Gardner, n. 960.

151. N. *flagellare* (n. sp.); caulibus procumbentibus v. volubilibus apice rufo-hirtis, foliolis 3 oblongo-lanceolatis obtusis mucronulatis subcoriaceis utrinque villosulis, pedunculis 1—2-floris folium subæquantibus.—Ramus centralis pedalis, rigidus, laterales elongati flagelliformes. Pili in partibus junioribus rufescentes. Petiolus 1—1½ pollicaris. Foliola 1—2 pollicaria. Stipulæ et bracteæ lato-lanceolatæ, acuminatæ, bracteolæ parum latiores, stipellæ angustiores. Flores perfecti in ramo centrali magnitudine *N. elliptici*, calyce villoso, corolla purpurea, vexillo basi carinaque flavescente. Flores fœminei in ramis lateralibus apetali, calyce abbreviato legumine juniore ad nervos piloso.—Rio Branco. Schomburgk.

152. Centrosema *verticillatum;* caule herbaceo glabro, ramulis junioribus pedunculisque puberulis, foliolis oblongo-ellipticis ovalibusve obtusis, pedunculis petiolo longioribus apice racemosis paucifloris, bracteolis ovalibus amplis calyce triplo longioribus extus puberulis, calycis dentibus superioribus brevissimis.—British Guiana. Schomburgk, n. 373.—Foliola 2—4-pollicaria. Stipellæ setaceæ. Bracteolæ 10 lin. longæ. Vexillum sesquipollicare, latissimum.

153. C. *Brasilianum*, *Benth. in Ann. Mus. Vind.* II. *p.* 118. —British Guiana. Schomburgk, n. 239.—Gardner's n. 1558, from Ceará, is a new species very near *C. arenarium*, which may be thus distinguished,

(C. *rigidulum;* caule frutescente? ramis duriusculis pubescentibus, foliis lanceolato-ovatis oblongisve obtusis mucronulatis subcoriaceis glabris v. subtus leviter puberulis, pedunculis axillaribus terminalibusve petiolo subæquilongis apice pauci-

floris, bracteolis ovatis obliquis acuminatis calyce sublongioribus, calycis dentibus superioribus tubo parum brevioribus, infimo longissimo.)

154. C. *macrocarpum;* caule juniore petiolisque pilosis demum glabrato, foliolis ovatis breviter acuminatis vix coriaceis supra vel utrinque glabris, pedunculis petiolum subæquantibus apice dense plurifloris, bracteolis dentibus calycinis subbrevioribus, calycibus latissimis 4-fidis, laciniis tubo longioribus divaricatis, suprema bidentata, inferioribus approximatis.—British Guiana. Schomburgk.—Different from *C. grandiflorum*, by its thinner and nearly glabrous leaves. The beans are eaten by the Indians, according to Schomburgk, and called Commawissi. He adds that the pods are uncommonly large; in the single specimen sent by him, the young ones are nine inches long.—Gardner's n. 173, from Rio Janeiro, is *Centrosema decumbens*, Mart.; his n. 356, from the Organ Mountains, is a new species belonging to the same division, and characterized in Taylor's *Annals of Nat. History, v.* II. *p.* 436.

155. C. *pascuorum, Mart.—Benth. Ann. Mus. Vind.* II. *p.* 120.—β. *brevipes*, pedunculis petiolo dimidio brevioribus, stipulis majoribus.—Dry savannahs. British Guiana. Schomburgk, n. 821.—Gardner's n. 1553, from Ceará, and Blanchet's n. 2721, from the Serra Jacobina, are a slight variety of *Periandra dulcis*, Mart., and the latter's No. 2555, from the same chain, is *P. coccinea*, Benth.

156. Stenolobium *cæruleum, Benth. in Ann. Mus. Vind.* II. *p.* 125.—British Guiana. Schomburgk, n. 218.—A widely diffused and apparently common plant; besides being found in various parts of Brazil, it is a native of St Vincent's, and of central America. It is Cuming's n. 1097, from Panama, and Gardner's n. 1564, from Ceará. A fourth species of *Stenolobium* (*S. velutinum, Benth. in Tayl. Ann. Nat. Hist. p.* 437) was gathered at Bahia by Saltzmann.

157. Galactia *velutina;* volubilis, mollissime villosa, foliolis 3 ovalibus obtusis basi subcordatis supra velutino subtus

sericeo-villosis, pedunculis brevissimis paucifloris, laciniis calycinis tubo subtriplo longioribus corolla parum brevioribus.—British Guiana. Schomburgk, n. 649.

158. Collæa *rosea;* caule suffruticoso erecto? tomentoso-villoso, foliolis 3 ovali-ellipticis utrinque obtusis submucronatis coriaceis supra pubescentibus subtus molliter villosis, pedunculis folio subbrevioribus interrupte racemosis, calycis villosi laciniis lanceolatis tubo parum longioribus, vexillo glabro, leguminibus cano-velutinis.—British Guiana. Schomburgk, n. 261.—Near *C. Neesii*, and *C. Martii*, but not agreeing exactly with these species; the flowers much smaller than in the former, and racemes much shorter. Gardner's n. 1556 is *Collæa glaucescens, Benth.*, and his 1552, from Ceará, is a *Camptosema* (*Bionia, Mart.*,) *Campt. coccineum*, (*Bionia coccinea* of my memoir); but differing in the form of the leaves and pedicellated flowers. It may be thus characterized:

(C. *pedicellatum;* fruticosum, canescens, foliis unifoliolatis foliolo obovato oblongo v. elliptico vix acuminato coriaceo supra glabro subtus sericeo, pedunculis folio brevioribus, pedicellis dimidium calycis longitudine attingentibus longioribusve.)

159. Dioclea *lasiocarpa, Mart.—Benth. l. c. p.* 133.—Gardner's n. 970 from Pernambuco, and 1563 from Ceará, and perhaps *Dolichos comosus* of Meyer's Essequibo Flora.

160. D. *Guianensis, Benth. l. c. p.* 134.—British Guiana. Schomburgk, n. 83.—β. *villosior;* foliolis supra pubescentibus subtus dense sericeis venis petiolisque rufescentibus. British Guiana. Schomburgk, n. 629.—Gardner's n. 1557, from Ceará, appears to be my *Dioclea rostrata*, and his n. 1559 a new *Dioclea* closely allied to *D. grandiflora*, (Mart.) His n. 353 from the Organ Mountains is *Cleobulia multiflora*, (Mart.); and n. 1562 from Ceará is *Cratylia nitens*, Benth., but with much longer racemes then in Pohl's specimens.

161. Cymbosema *roseum* (gen. nov.)—Rio Branco. Schomburgk, n. 850.—This genus is allied to *Dioclea*, from which it differs in the vexillary stamen being entirely free, in the

oblong flowers and falcate pod. Its characters are therefore nearer to those of the *Euphaseoleæ*, but it has entirely the habit of *Diocleæ*.

CHAR. GEN. CYMBOSEMA. *Cal.* tubuloso-campanulatus, 4-fidus, laciniis imbricatis, suprema latiore bidentata, intus subglobosa. Corollæ petala breviter unguiculata subæquilonga. Vexillum erectum, oblongo-ovatum, complicato-carinatum, ecallosum, basi marginibus inflexis biappendiculatum. Alæ oblongæ. Carina petala alis conformes dorso supra medium connata. Stamen vexillare liberum, cætera connata. Antheræ uniformes. Discus breviter vaginifer. Ovarium subsessile pluri-ovulatum. Stylus incurvus apice truncatus, stigmate terminali. Legumen oblongo-falcatum, plano-compressum, crassiusculum, coriaceum, stylo apiculatum. Semina (nondum matura) transversa, compressa, hilo lineari.—Species *C. roseum.* Caulis herbaceus, volubilis, pilis reflexis villosis, demum glabratus. Foliola 3, ovali-oblonga, 3-pollicaria, obtusa, lateralia basi subobliqua, supra et subtus ad venas hirtella. Pedunculus pedalis supra medium florifer, nodi floriferi sessiles. Pedicelli breves. Bracteolæ ovatæ minutæ. Flores fere bipollicares. Calyx semipollicaris adpresse puberulus v. fere glaber. Corolla rosea, vexillo glabriusculo. Legumen (nondum maturum) $1\frac{1}{2}$—2 poll. longum, $\frac{3}{4}$ poll. latum, adpresse pilosum, acumine longo rigido.—Gardner's n. 355, from the Organ mountains, is *Canevalia picta*, (Mart.) *var.*—Cuming's n. 1204, from Panama, is a slight *var.* of *C. obtusifolia, DC.*—Blanchet's n. 2748, from Utinga in the province of Bahia, is *C. Brasiliensis* (Mart.), which species is also in Saltzmann's Bahia collection.

162. A single specimen of a very fine *Phaseolea*, allied to *Canavalia*, and somewhat to *Vexillaria*, perhaps a new genus, but too imperfect for description.

163. Phaseolus *lasiocarpus, Mart. in Benth. l. c. p.* 140.—British Guiana. Schomburgk.

164. P. *longipedunculatus, Mart. in Benth. l. c. p.* 141. *var.* α. et β.—French Guiana.

165. P. *linearis, H. B. K.?*—Arid savannahs at the foot of the Conocon Mountains. Schomburgk.

166. P. *gracilis, Pöpp. in Benth. l. c.?*—Arid savannahs about Anna-y. Schomburgk. The specimens of the three last *Phaseoli* very imperfect.

167. Eriosema *rufum.*—Rhynchosia (Eriosema) *rufa DC. Prodr.* II. *p.* 388.—British Guiana. Schomburgk, n. 828.

168. E. *lanceolatum;* caulibus basi procumbentibus appresse pilosis apice ascendentibus rufo-barbatis, stipulis in unum lanceolatum oppositifolium connatis, petiolis brevissimis foliolo unico late lanceolato obtuso mucronato basi subcordato supra glabro subtus ad venas appresse ferrugineo, racemis brevibus paucifloris.—British Guiana. Schomburgk, n. 651. French Guiana.—"Flowers yellow." Schomburgk.

169. E. *violaceum.* Rhynchosia (*Eriosema*) *violacea, DC.* —Cytisus, *Aubl. Pl. Guian.* II. *p.* 766. *t.* 306.—British Guiana. Schomburgk, n. 642.

170. E. *crinitum.* Rhynchosia (*Eriosema*) *crinita, DC.*—Glycine, *H.B.K. Nov. Gen. et Sp.* VI. *p.* 421. *t.* 573.—British Guiana. Schomburgk. Ceará, Brazil. Gardner, n. 1549.

171. E. *pulchellum.* Rhynchosia (*Eriosema*) *pulchella, DC.* —Glycine, *H.B.K. l. c. p.* 422?—Both the last species numbered (perhaps erroneously) 245, by Schomburgk.

TRIBE DALBERGIEÆ.

After my memoir of this tribe in the *Vienna Annals*, had been sent to press, a second paper of Vogel's appeared in the *Linnæa*, in which were described two new genera as belonging to the tribe, viz.:—*Sphinctolobium* and *Platypodium.* Of these, the latter is the same as my *Callisemæa*, of which I had not then seen the fruit. Owing to the delay in the publication of my memoirs, Vogel's name has the priority, and should be substituted for mine.

The other genus, *Sphinctolobium*, differs only from *Lonchocarpus* in the fruit, which is thick and coriaceous, instead

of being thin and membranous, as described by Kunth from the *Lonchocarpus Domingensis* and *latifolius.* The *L. sericeus* belongs to *Sphinctolobium*, and perhaps some other species published as *Lonchocarpus.* In both genera the fruit is indehiscent, which I have ascertained since I published the three species in the former part of this enumeration, and in this respect they would both belong to *Dalbergieæ* ; whilst on the other hand the complete monadelphous stamens, and the alæ adherent to the wings, connect them with the frutescent *Tephrosiæ* and other *Galegeæ.*

I had overlooked in my memoir the *Semeionotis* of Schott (*Linnæa, Littbl. v.* VI. *p.* 55.) which he says is allied to *Dalbergia* and *Nissolia.* But his character is so imperfect, that the genus must yet remain among the doubtful ones.

The *Lonchocarpus pterocarpus*, (*DC. Prod.* II. *p.* 260), is a distinct genus, in which the fruit is membranous as in *Platymiscium* and *Miscolobium*, but with the addition of a wing along the vexillary suture. I believe it to be the same plant to which M. Riedel of Rio Janeiro has given the *ms.* name of *Phyllocarpus.*

In a fine set of near 200 *Leguminosæ*, gathered by M. P. Claussen in the neighbourhood of Caxociras do Campos, near the Rio Francisco in the province of Minas Geraes, and communicated to me by Baron B. Delessert, is a second species of the curious genus, *Cyclolobium*, which enables me to complete, as follows, the generic character.

CYCLOLOBIUM. Calyx late campanulatus 5-dentatus. Corollæ vexillum patens, unguiculatum, orbiculatum, emarginatum, alis parum longius; alæ oblongæ; carina oblonga, subrecta, alis parum brevior, petalis dorso appressis vix concretis. Stamina 10, vexillare liberum, cætera breviter connexa. Antheræ oblongæ medifixæ, loculis longitudinaliter dehiscentibus. Ovarium stipitatum, pluriovulatum, ovulis anatropis. Stylus subulatus, incurvus. Stigma terminale, truncatum. Legumen stipitatum, orbiculatum, plano-compressum reticulatum membranaceum indehiscens, sutura utroque convexa, vexillari anguste alata, carinali nuda.

Semina 2-3 transversa, embryone recto.—Frutices Brasilienses. Folia alterna, petiolo apice unifoliolato. Racemi axillares v. laterales, subsimplices, solitarii v. fasciculati. Bracteæ parvæ. Bracteolæ minutæ deciduæ.—Species 1. C. *Brasiliense* (*Benth. in Ann. Mus. Vind.* II. *p.* 92); foliis (1-1½ pollicaribus) ovato-oblongis basi rotundatis angustatisve subtus ferrugineo-puberulis. 2. C. *Clausseni* (sp. n.); foliis (3-6-pollicaribus) ovato-lanceolatis basi subcordatis utrinque glaberrimis.

172. Ecastophyllum *Monetaria*, *DC. Prodr.* II. *p.* 421. —*var.* foliis 3-5-pollicaribus, acumine subpollicari retuso.—Frutex sarmentosus, floribus albis.—British Guiana. Schomburgk, n. 492. French Guiana. Herb. Richard.—This variety, remarkable for the size of its leaves, was considered by the elder Richard as a distinct species under the name of *E. mucronatum.*

Ecastophyllum pubescens, of which I have received from the Paris Museum fine specimens, gathered in Cayenne by Martin, has the inflorescence of *E. Monetaria*, 9 stamina, of which one is free and the remainder equally diadelphous, the leaflets smaller than in most species, and the pod thin as in *E. Monetaria.* Allied to it in foliage is the following new species from the same collection :—*E. foliosum*; ramulis petiolisque ferrugineo-puberulis, foliolis 5-7 alternis ovatis oblongisve glabris, inflorescentia subcymosa, leguminibus crassis ovato-orbiculatis glabris. The specimens are in fruit only.

Of the next genus, *Moutouchia* (Aubl.), I have now examined the flowers of *M. Draco*, and seen the fruit of *M. Draco*, *M. suberosa*, and a third species or variety allied to *M. suberosa*, but apparently with a larger and less rugose fruit and narrower leaflets. They are all three in the Guiana collections in the Paris Museum. The following corrections should be made to my description of the wings of the fruit. "Sutura vexillaris anguste coriaceo-alata, carinalis exalata, in membranam coriaceam alæformem expansa." It still appears desirable to separate the genus from the Asiatic *Pterocarpi*, of which the African *Echinodini* may be a mere section.

173. *Amphymenium Rohrii, H. B. K. Nov. Gen. et Sp.* II. *p.* 380.—*Pterocarpus Rohrii, Vahl, DC. Prodr.* II. *p.* 418.—*Phellocarpus floridus, Benth. in Ann. Mus. Vind.* II. *p.* 106.—Falls of the Essequibo, British Guiana. Schomburgk, n. 34. Demerara, Parker. French Guiana, Martin. Woods on the Rio Madeira near Borba in Brazil. Herb. Mus. Petrop.—Pará. Sieber. On the Amazon River, Pöppig.—Amongst the numerous specimens I have seen, mostly without fruit, it is possible there may be more than one species; but at present I have not materials to distinguish them.

From not having seen the fruit, I had referred three plants to the genus *Phellocarpus*, which are probably all *Amphymenia:* 1st. my P. *floridus* quoted above; 2d. P. *acutus*, which I have not since met with; and 3d. my P. *laxiflorus* from Rio Janeiro, which is *Pterocarpus* (*Amphymenium*) *violaceus, Vog. Linnæa.* XI. *p.* 416. The latter species cannot, however, retain Vogel's specific name, as the flowers are yellow, not violet; nor can it be Aublet's *Acouroa violacea*, which latter appears to me to be an *Ecastaphyllum.* The Rio plant may therefore take the name of *Amphymenium laxiflorum.*

174. *Centrolobium robustum, Mart.—Benth. Ann. Mus. Vind.* II. *p.* 95.—British Guiana. Schomburgk (a few pods only). Near Rio Janeiro, Martius. Ubatuba, province of St Paul. Guillemin.

Having now examined complete specimens of this and another new species, I here subjoin their generic and specific characters.

Centrolobium. Calyx incurvus, oblique turbinato-campanulatus, fere ad medium 4-fidus, lacinia suprema latiore integra vel emarginata. Petala subæquilonga; vexillum orbiculatum, reflexum; alæ falcato-oblongæ; petala carinalia alis subconformia, apice dorso connata. Stamina monadelpha, vagina supra fissa, vexillare basi liberum. Ovarium sessile, oblongum, obtusum, villosum, 2—(aut 3-?) ovulatum, ovulis amphitropis. Stylus lateralis, incurvus, hispidus, subulatus. Stigma minutum terminale. Legumen subsessile, ovatum v. globosum, spinis obtectum, sutura vexillari brevi nuda apice stylo

persistente subspinescente mucronata, carinali convexa apice in alam oblongam v. ovato-cultriformem legumine ipso longiorem producta, intus fungosum uniloculare. Semen unicum, oblongo-subreniforme, radicula brevi incurva.—Frutices scandentes, elati. Folia alterna, ampla, impari-pinnata. Paniculæ terminales amplæ. Bracteæ et bracteolæ lineares, v. subulatæ.—1. *C. robustum*, (*Mart.*); foliis glabriusculis, foliolis 13-17 ovato-oblongis basi oblique rotundatis supra lævibus subtus glanduloso-punctatis, leguminibus longe spinosis, ala falcato-oblonga.—2. *C. tomentosum*, (*Guillem. Ms.*); foliolis 13-17 ovato-oblongis basi oblique truncato-cordatis supra pubescentibus subtus rachi et panicula dense ferrugineo-tomentosis, leguminibus breviter spinosis, ala late falcato-ovata.—Brasilia, Guillemin. Caxoeiras do Campos, P. Claussen.

175. Drepanocarpus *inundatus*, *Mart.*—*Benth. Ann. Mus. Vind.* II. *p.* 96.—Falls of the Essequibo and Rupunoony. Schomburgk, n. 520, also n. 327, the specimens in fruit, not those in flower. French Guiana, Perottet. On the Rio Negro. *Martius.* On the Amazon. *Pöppig.*

176. D. *ferox*, *Mart.*—*Benth. Ann. Mus. Vind.* II. *p.* 96.—British Guiana. Schomburgk, n. 267.—In these specimens, as in Martius', the leaflets are above an inch long, and under twenty in number.

The *D. lunatus*, of which I have specimens both from the West Indies and from tropical Africa, belongs to my first section, not to the second where I had erroneously placed it.

177. Machærium *affine*, *Benth. Ann. Mus. Vind.* II. *p.* 98.—A tree from thirty to forty feet high. Woods near the Parime and Conocon mountains. Schomburgk, n. 78.

No. 357, of Gardner's Organ mountain collection, is a *Machærium*, allied to *M. sericiflorum*, (*Vog.*); but apparently new.

178. M. *leiophyllum*, *Benth. l. c. p.* 100.—*Nissolia leiophylla*, *DC. Prodr.* II. *p.* 258.—Sides of rivers, British Guiana; where it is known by the name of *Boheery Die*, or Bat-flower. Schomburgk, n. 482. French Guiana, Perrottet.—The pod

is much more falcate in this than in most species, and is an approach to that of *Drepanocarpus*.

179. M. *Schomburgkii* (sp. n.); ramis petiolisque glabris, stipulis sub-persistentibus muticis, foliolis quinis oblongis obtuse acuminatis mucrone subulato deciduo appendiculatis coriaceis glaberrimis v. subtus sparse pilosulis, racemis densis brevibus subramosis, bracteis calycibus vexilloque dense sericeis.—A large tree known by the name of *Stikerrituribally*, furnishing a valuable wood for furniture; the flowers smell like violets. British Guiana. Schomburgk, n. 327.—Leaflets two, three, or four inches long, the lateral nerves distant and reticulate. Flowers nearly those of *M. Brasiliense*, and *M. erianthum*.

180. M. *nervosum*, *Vogel*, *Linnæa*, XI. *p*. 186?—This answers to Vogel's description in most points; yet in the specimens before me the flowers are rather large for the genus, and the sheath of the ovarium is not so long as he describes.—British Guiana. Schomburgk, n. 579.

Gardner's n. 24, from Rio Janeiro, is *M. oblongifolium*, (*Vog.*); his No. 1539, from Ceará, is a new and very distinct species, thus characterized. *M. macrocarpum*; foliolis 5—7 lato-ovatis retusis basi subcordatis reticulato-venosis coriaceis glabris, panicula ramosa laxa petiolisque canescentibus, calycibus pedicellatis turbinatis glabris, petalis glabris, ala carina breviore, legumine glabro longiuscule stipitato crasso sutura vexillari valde convexa, ala cultriformi.—Flores primo intuitu fere *Bowdichiæ*. Legumen cum stipite fere 4-pollicare.

In the collections of Claussen and of the Petersburgh Academy, are several *Machæria* which appear to be new, but I have not at present sufficient materials for comparing them with some of Dr Vogel's species.

181. Trioptolemea *riparia*, *Mart.—Benth. Ann. Mus. Vind.* II. *p*. 103.—Cymæ nunc axillares, nunc terminales paniculatæ.—Banks of the Rio Negro. Schomburgk, n. 907.

182. T. *ovata*, *Mart.—Benth. l. c.*, *var.?* foliolis angustioribus.—Pirarara, British Guiana. Schomburgk, n. 801.—As I have not seen the fruit, I am uncertain whether the

specimen before me belongs to *T. ovata*, or *T. montana*, or whether it may not be distinct from both, not exactly agreeing with either in foliage.

Gardner's n. 1537, from Ceará, is a new species allied to *T. myriantha*, but distinguished as follows:—*T. pubescens*, foliolis 6—9 lato-ovatis obtusis retusisve coriaceis supra glabris nitidis, subtus ad nervos petiolis rachi et ramulis ferrugineo-pubescentibus, cymis axillaribus paniculatis multifloris.—This is the first, out of hundreds of specimens of various species, in which I have seen the young fruits with the flowers that produce them. I now perceive that I was mistaken in considering the genus as unisexual, the fertile flowers being precisely similar to those which from their constant abortion I had considered as males.

M. Guillemin has ascertained that it is chiefly the several species of *Trioptolemea*, which are known in Brazil under the name of *Jacaranda*, and furnish the Rosewood of our cabinet-makers.

Of the genera *Miscolobium* and *Platymiscium*, I have as yet seen no Guiana specimens; but it is probable they may both be hereafter detected in that country, as the former has an extensive range in Brazil, and is also found in tropical Africa, from whence M. Guillemin has communicated to me three Senegambian species; and I have seen *Platymiscia*, generally very bad specimens, from the West Indies, as well as from various parts of Brazil. Vogel's genus *Platypodium* (*Callisema* of my memoir), appears to be confined to Brazil.

183. Deguelia *scandens*, *Aubl. Pl. Guian.* II. *p.* 750. *t.* 300. *DC. Prodr.* II. *p.* 422.—On the high banks of the Quitaro. Schomburgk, n. 564.—These specimens, being in flower only, cannot further elucidate the affinities of the genus. I have however a specimen with ripe fruit gathered by Mr Parker in Demerara, which has so nearly the foliage and inflorescence of Aublet's plant, that although perhaps specifically distinct, it appears to be a congener; and if that be the case, *Deguelia* is scarcely to be distinguished from my second section of *Andira*.

184. Andira *laurifolia, Benth. Ann. Mus. Vind.* II. *p.* 109. —On the Rio Quitaro, British Guiana. Schomburgk, n. 587. Serra Jacobina, province of Bahia in Brazil, Blanchet, n. 2723. Amongst Martin's Cayenne plants is *Andira retusa*, (Kunth), to which is to be referred the *Geoffroya pubescens*, (Rich.). Gardner's n. 1538, from Ceará, is a new species of *Andira*. Blanchet's n. 2650, from the Serra Jacobina, and Gardner's n. 964, from Pernambuco, and 1911, from Ceará, are the *Geoffroya superba*, (*H. B. K.*) The *Geoffroyæ*, as now limited, appear to be really distinct from *Andira*, by the form of the calyx, the simple racemose inflorescence, the yellow colour of the flowers, and the alternate arrangement of the leaflets. Amongst Martin's Cayenne plants is the following new species. G. *discolor;* foliolis 7—9 ovali-oblongis acuminatis v. obtusiusculis basi obliquis glabriusculis supra viridibus subtus canescentibus, racemis calycibusque ferrugineo-tomentosis, vexillo extus pubescente. Folia adulta pedalia, foliolis 2—3 pollicaribus. Ramuli et petioli juniores ferruginei, adulti glabrati.

185. Dipteryx *oppositifolia, Willd.—DC. Prodr.* II. *p.* 477. —*Taralea oppositifolia, Aubl. Pl. Guian.* II. *p.* 745. *t.* 298.— A tree of fifty or sixty feet, beautifully covered with lilac blossoms, the wood uncommonly hard. On the Rio Quitaro, British Guiana. Schomburgk, n. 559.—*Dipteryx pterota*, (Mart.) is the same species as *D. alata*, (Vogel), published about the same time. It occurs in many Brazilian collections.

My genus *Commilobium* appears to be identical with Vogel's *Pterodon*, although that author does not mention the petaloid nature of the upper lobes of the calyx, and describes the wings of the corolla as entire. His species, however, with only 7 leaflets to the leaves, is evidently different from either of mine; and Blanchet's n. 2805, from the Serra Acurua, is a fourth species, hitherto unpublished.

Tribe Sophoreæ.

This tribe forms so exactly the connecting link between the two great Suborders of *Papilionaceæ*, and *Cæsalpinieæ*, that the

more the species are known, the more difficult it becomes to draw the precise line of demarcation between the two, most of the characters, hitherto considered as absolute, having ultimately broken down when better examined. All that remains to be done, is to combine the characters common to the great mass of each Suborder, without giving to any one a value so definite as to remove particular species from others with which they are, in other respects, intimately connected. The most important, and that which it now appears may be the most safely trusted to, in almost every instance, is the æstivation of the corolla, which in the *Papilionaceæ* is always regularly papilionaceous, the vexillum overlapping the two alæ and these in their turn enclosing the carina. In *Cæsalpinieæ*, it is most commonly the very reverse, being what Vogel* has appropriately denominated *carinal*, that is to say, the lower or carinal petals enclose the alæ, and the vexillum is inside of all. In some genera, as for instance, *Exostyles*, the æstivation is regularly twisted, each petal overlapping the adjoining one on one side, and sometimes the alæ are outside instead of the carina, the vexillum remaining inside of all. It is only in the genus *Leptolobium* that some species, having a truly papilionaceous æstivation, appear however better placed among *Cæsalpinieæ*.

The character next in value, derived from the form of the embryo and direction of the radicle, is the one to which the most importance has been attached, and has induced the absolute division of *Leguminosæ* into *Curvembrieæ* and *Rectembrieæ;* but it is now ascertained that if rigidly followed up, this division would be most unnatural. Taking it however merely as a general character, it appears that the embryo is, with very few exceptions, curved in *Podalyrieæ*, *Loteæ*, *Hedysareæ*, *Vicieæ*, and *Phaseoleæ*, in all of which the papilionaceous corolla is also the most decided; more or less curved or quite straight in the *Dalbergieæ*, and *Sophoreæ*, which form an

* See Linnæa, v. XI. p. 381, where this æstivation appears to have been first pointed out by Vogel.

approach to *Cæsalpinieæ;* and, with very few exceptions, straight in the *Cæsalpinieæ*. The stamens in *Papilionaceæ* are almost universally *ten*, either united or more or less approximated in the form of a tube round the ovary. In *Cæsalpinieæ*, an increase or reduction in number, and anomalies in the form and arrangement of these organs, are very frequent. The bipinnate leaves of some *Cæsalpinieæ* never occur in *Papilionaceæ*.

Under these limitations the *Sophoreæ* form the last group of *Papilionaceæ*, with which the æstivation of the corolla unites them; although they approach the *Cæsalpinieæ* by their embryo, usually straight or nearly so, by their free stamens and by their corolla, which though *Papilionaceous* in æstivation, is often scarcely so in the form and proportion of the petals. The tribe is distinguished from *Podalyrieæ*, by the foliage; from *Hedysareæ*, by the pod; from the other *Papilionaceous* tribes, by the stamens. From among the genera included in the tribe in my above quoted memoir, *Cercis* must be again rejected to the neighbourhood of *Bauhinia*, where De Candolle had placed it; and *Cadia*, *Layia*, and *Gourliæa*, must probably be admitted among *Sophoreæ*.

186. Bowdichia *major*, *Mart.—Benth. Ann. Mus. Vind.* II. *p.* 89. *var. fruticosa.*—A low shrub growing in rocky situations, British Guiana. Schomburgk, n. 640. I can find no character but stature to separate this plant from *B. major*, a tree having a very extensive geographical range and which may be the original *B. virgilioides* of Kunth. My *B. floribunda* may also prove a mere variety.

187. Ormosia *coccinea*, *Jacks. Trans. Soc. Linn. Lond.* X. *p.* 360. *t.* 25.—Banks of the Quitaro. Schomburgk, n. 580. —The Brazilian specimens usually referred to *O. coccinea*, are a distinct species; probably *O. nitida*, *Vogel.*

188. A single specimen from the Pacaraima mountains, of an *Ormosia* evidently distinct from *O. coccinea*, and apparently new, but not in a state to describe.

189. Diplotropis *nitida* (sp. n.); foliolis 5—7 ovato-oblongis sublanceolatisve acuminatis basi rotundatis valde coriaceis nitidis utrinque petioloque glabris, staminibus inferioribus

longioribus, legumine glabro.—Pedrero. Schomburgk, n. 896. Brasilia. *Herb. Mus. Par.* Borba on the Rio Negro. *Herb. Mus. Petrop.*—Arbor 30—40 pedalis. Ramuli angulati, verrucosi. Stipulæ subpersistentes, crassæ, lineares, obtusæ, incurvæ, 2—3 lin. longæ. Foliola 3—5 pollicaria breviter petiolulata, exstipellata. Panicula terminalis, foliis brevior. Rachis et calyces tomento brevissimo in sicco ferruginei. Bracteæ ad basin ramorum breves ovatæ acutæ, ad basin pedicellorum uti bracteolæ minutæ dentiformes. Flores albi, odorati, vix 5 lin. longi. Vexillum glabrum obovatum. Petala inferiora oblonga. Stamina suprema breviora, nec omnia alternatim breviora et longiora ut in *D. Martini.* Legumen (nondum maturum) ovali-oblongum, subincurvum, planocompressum glaberrimum, juxta suturam vexillarum utrinque leviter nervatum.

Suborder Cæsalpinieæ.

The genera of this Suborder have been usually enumerated with little or no method in their arrangement, many of them being even now but very imperfectly known; but they have become so numerous that it is necessary to make some attempt at grouping them, and I have therefore ventured to propose the following tribes, in which I have placed for the present such of the genera as I have means of examining, though there is little doubt that a better acquaintance with some of them may hereafter considerably modify the circumscription and characters of one or two of the tribes.

Tribe I. *Leptolobieæ.* Calyx plerumque campanulatus 5-fidus. Petala quinque, parum inæqualia. Stamina 10 fertilia, parum inæqualia, declinata vel divergentia. Ovarii stipes a calyce liber. Folia simpliciter abrupte vel subimparipinnata.—Genera: *Leptolobium,* Vog.; *Sclerolobium,* Vog.; *Acosmium,* Schott; *Zuccagnia,* Cav.; *Hæmatoxylon,* Linn.; *Pöppigia,* Presl; *Parkinsonia,* L.

Tribe II. *Eucæsalpinieæ.* Calyx 5-fidus v. sæpius 5-partitus. Petala quinque, parum inæqualia. Stamina 10 fertilia, parum declinata. Ovarii stipes a calyce liber. Folia bipinnata.

—Genera *Gymnocladus*, Linn.; *Guilandina*, Linn.; *Poinciana*, Linn.; *Coulteria*, Humb. et Kunth; *Cæsalpinia*, Linn.; *Peltophorum*, Vog.; *Schizolobium*, Vog.; *Mezoneurum*, Desf.; *Pterolobium*, Br.; *Colvillea*, Boj. (ex ic. et descr.) *Cladotrichium*, Vog.; *Hoffmanseggia*, Cav.; *Pomaria*, Cav.; *Melanosticta*, DC.—Genus *Moldenhawera*, Schrad., hinc *Eucæsalpinieis*, hinc *Cassieis*, v. *Amherstieis* affine est.

Tribe III. *Cassieæ*. Calyx 5-partitus. Petala 5. Stamina vix perigyna, 10 vel pauciora, nonnulla sæpius difformia v. deficientia. Antheræ sæpius magnæ oblongæ v. quadrangulares, apice v. rarius foramine basilari dehiscentes. Ovarii stipes liber. Folia abrupte v. rarius subimpari-pinnata.—Genera *Cassia*, L.; *Labichea*, Gaudich.; *Dicorynia*, Benth.

Tribe IV. *Swartzieæ*. Calyx valvatim dehiscens, nunc irregulariter rumpens, nunc usque ad basin in lacinias 4—5 subæquales fissus. Petala 5 vel pauciora, sæpe unicum vel nullum. Stamina indefinita, nunc pauca numerosissima, subæqualia v. valde inæqualia dissimilia, cum petalis subhypogyna v. rarius distincte perigyna. Folia impari-pinnata 1-pluri-foliolata. Bracteolæ sæpius nullæ.—Genera *Martiusia*, Benth.; *Zollernia*, Nees et Mart.; *Swartzia*, Willd.; *Cordyla*, Lour.; *Allania*, Benth.

Tribe V. *Amherstieæ*. Calyx basi tubulosus persistens, laciniis 4—5 concavis imbricatis per anthesin reflexis v. deciduis. Petala 5 v. pauciora sæpe unicum. Stamina 10 v. sæpius pauciora v. plura, nonnulla v. omnia sæpius longissima in alabastro replicata. Ovarii stipes cum calycis tubo uno latere sæpius connatus. Folia abrupte v. rarissime imparipinnata pluri-juga.—Genera, *Brownea*, Jacq.; *Elizabetha*, Schomb.; *Heterostemon*, Desf.; *Amherstia*, Wall.; *Jonesia*, Roxb.; *Humboldtia*, Vahl.; *Schotia*, Jacq.; *Theodora*, Medik.; *Afzelia*, Sm.; *Eperua*, Aubl.; *Parivoa*, Aubl.; *Campsiandra*, Benth.; *Tachigalia*, Aubl.; *Exostyles*,* Schott.; *Melanoxylon*,

* This is a somewhat anomalous genus, especially in the great regularity of the stamens; I do not however find the regularly twisted æstivation figured by Endlicher in his *Atakta*; in my specimens, the upper petal is constantly overlapped by both the adjoining ones.

Schott; (*Perittium*, Vog.;) *Tamarindus*, Linn.; *Outea*, Aubl.; *Anthonota*, P. de Beauv.; *Intsia*, Pet. Thou.; *Vouapa*, Aubl.; *Peltogyne*, Vog.; *Trachylobium*, Hayne; *Hymenæa*, Linn.

TRIBE VI. *Bauhinieæ*. Calyx basi tubulosus subpersistens limbi laciniis nunc elongatis subvalvatis nunc parvis dentiformibus. Petala 5. Stamina 10 v. pauciora. Ovarii stipes liber v. connatus. Folia constantia foliolis 2 nunc omnino liberis nunc omnino v. partim margine interiore nerviformi connatis, rarius unifoliolata.—Genera *Casparia*, Kunth; *Bauhinia*, Linn.; et genera duo v. tria Asiatica ab ea separanda; *Schnella*, Raddi; *Etaballia*, Benth.; *Cercis*, Linn.

TRIBE VII. *Cynometreæ*. Calyx 4—5 partitus, laciniis imbricatis per anthesin reflexis. Petala 4—5 subæqualia v. sæpius nulla. Stamina 10 v. pauciora, æqualia v. parum inæqualia. Ovarium subsessile uni- vel bi-ovulatum, stipite libero. Legumen monospermum vel dispermum. Folia 1-plurijuga abrupte vel rarius subimpari-pinnata.—Genera *Cynometra*, Linn.; *Hardwickia*, Roxb.; *Copaifera*, Linn.; *Dialium*, Linn.; (*Codarium* Soland.); *Apuleia*, Mart.; *Detarium*, Juss; *Crudya*, Willd.

TRIBE VIII. *Dimorphandreæ*. Calyx campanulatus æqualis 5-dentatus. Petala 5 subæqualia. Stamina 10, 5 fertilia æqualia, alterna sterilia. Folia simpliciter vel bi-pinnata. Flores dense spicati spicis paniculatis.—Genera, *Mora*, Benth.; *Dimorphandra*, Schott.

Genera incertæ sedis *Acrocarpus*, Arn.; *Ceratonia*, Linn.

Genera papilionacea ab auctoribus inter Cæsalpinieas enumerata ad Sophoreas amandentur.—Genus *Gleditschia*, forte ad Mimoseas, nisi *G. Caspica*, quæ vix cæteris congener videtur, et verosimiliter genus novum *Ceratoniæ* affine.

Sequentia mihi incognita sunt: *Palovea*, Aubl.; *Vatairea*, Aubl.; *Amaria*, Mut.; *Metrocynia*, Thou.; *Anemia*, Lour.; *Baryxylum*, Lour.; *Aloexylon*, Lour.

TRIBE LEPTOLOBIEÆ.

190. Leptolobium *nitens*, *Vogel*, *Linnæa*, XI. *p*. 394?—A tree of forty to fifty feet in height.—Falls of the Essequibo

and Rupunoony. Schomburgk, n. 526.—This only differs from Vogel's description in the number of leaflets, which in Schomburgk's specimens are usually nine.

191. Hœmatoxylum *Campechianum*, *Linn.—DC. Prodr.* II. *p.* 485.—French Guiana. Leprieur, *Herb. Par. n.* 8.

Cuming's n. 1304, from Panama, appears to be Presl's *Pöppigia procera;* Blanchet's n. 2667, and 2796, from the province of Bahia, are a second species. The pod in the genus is broadly linear, flat, membranous, straight, with a narrow membranous wing along the upper or vexillary suture.

There are no *Eucæsalpinieæ* in the Guiana collections before me. Gardner's n. 1277 and 1288 appear to belong to the genus *Cæsalpinia;* his n. 1279, from the same country, is *Peltophorum Vogelianum*, (mihi); or *Cæsalpinia dubia*, *Spreng.* and *Vogel*, *Linnæa*, XI. *p.* 406, and *Cæsalpinia Brasiliensis* of many authors as to the Brazilian station. The *Cæsalpinia Brasiliensis*, from Jamaica, is a second species of the genus *Peltophorum* (*Brasilettia*, *DC.*)*;* as it appears not to be a Brazilian plant, it may be called *Peltophorum Linnæi.*

There are one or two distinct East Indian genera, confounded under *Cæsalpinia*, but it would lead too far to enter into them in this place.

Tribe Cassieæ.

192. Cassia *moschata*, *Humb. et Kunth.—Vogel*, *Syn. Cass. n.* 2.—"Tree of twenty to thirty feet. Pod like that of *C. fistula*, but much longer."—British Guiana. Schomburgk, n. 894.—The *Cassia ferruginea*, *Schrad.* and *Vogel*, *Syn. n.* 1. *var.* β., appears to me to be the plant common in Brazil described by Vogel, (n. 13), under the name of *C. staminea.* It has a cylindrical smooth pod.

Among Claussen's plants, is a species like it in foliage, but with the flowers and fruit of *C. Humboldtiana*, DC., (*Vogel*, *n.* 14.) This is what I take to be *C. excelsa*, *Schrad.* Gardner's n. 1912, from Ceará, is closely allied to it, but apparently a different species.

193. C. *bacillaris*, *Linn.—Vogel. Syn. n.* 15.—Woods near the Parima mountains. Schomburgk, n. 94 and 614.

194. C. *latifolia*, *W. Mey. Prim. Fl. Esseq. p.* 166.—A single very imperfect specimen; but easily recognisable by the large persistent broadly cordate foliaceous stipules. On the upper Essequibo. Schomburgk.

195. C. (*Chamæfistula*), *undulata* (sp. n.); fruticosa, foliolis bijugis falcato-oblongis ovatisve inæquilateris acuminatis margine undulatis supra glabris nitidis, subtus minute puberulis, glandula oblongâ substipitata inter utrumque par, panicula terminali, legumine subtereti dehiscente.—Frutex 10—12-pedalis. Rami glabri, teretes. Stipulæ lanceolato-falcatæ, acutissimæ membranaceæ subpersistentes. Petiolus 2—3-pollicaris, glaber v. linea pilosa notatus, seta terminatus. Foliola paris ultimi 2—3 pollicaria, basi inæqualiter angustata, paris inferioris dimidio minora basi rotundata, omnium longiuscule acuminata, acumine obtuso cum mucrone. Panicula densa brevis. Sepala obovata, membranacea, vix puberula. Petala calyce duplo longiora aurantiaca, reticulato-venosa, extus puberula. Stamina sterilia minuta. Ovarium pubescens. Stigma magnum. Legumen 4—6-pollicare, subteres, fuscum, prope suturam vexillarem utrinque angustissime subulatum, ad suturam subdehiscens. Semina omnia horizontalia.—Woods skirting the savannahs. British Guiana. Schomburgk, n. 86.—Trinidad, Lockhart.

Gardner's n. 368, from the Organ mountains, is a less hairy variety of *C. bijuga*, (*Vogel*); his n. 1568, from Ceará, is a *Chamæfistula*, perhaps new, allied to *C. striata*.

196. C. *chrysotricha*, *Collad.*—*Vog. Syn. n.* 50.—British Guiana. Schomburgk.—French Guiana, Leprieur, *Herb. Par. n.* 53.

197. C. *multijuga*, *Rich. Ann. Soc. Hist. Nat. Par. p.* 108. —*C. calliantha*, *W. Mey. Prim. Fl. Esseq. p.* 169.—Banks of the Essequibo and Rupunoony, British Guiana. Schomburgk, n. 522.—This is a handsome tree, allied to, but specifically distinct from, *C. Selloi*. The latter species is frequently sent from the neighbourhood of Rio Janeiro, and varies much in the number of the interfoliaceous glands. It is Gardner's n. 366, from the Organ mountains, and I cannot distinguish from it *C. magnifica*, of Martius. Gardner's n.

367 is closely allied to it, but appears different. His n. 1575, from Ceará, is also new.

198. C. *Trinitatis*, *Reichb.*—*Vogel*, *Syn. n.* 153.—Pedrero, British Guiana. Schomburgk, n. 895.

199. C. *obtusifolia*, *Linn.*—*β. uniglandulosa*, *Vog. Syn. n.* 45.—British Guiana. Schomburgk, n. 843.—Gardner's n. 1570, from Ceará, is *C. sericea*, *Sw.*—*C. ramiflora*, of Vogel, (*Syn. n.* 165,) is evidently the same species as *C. Apoucouita* of Aublet, a plant which I have seen from many parts of Brazil, and, as I believe, from French Guiana, though it be not in the Guiana collection now before me.

200. C. (*Baseophyllum*), *polystachya* (sp. n.); ramis foliisque glabris, foliolis trijugis ovato-ellipticis orbiculatisve retusis basi oblique cordatis coriaceis nitidis, glandula petiolari magna infra par infimum et nonnunquam prope par supremum, racemis axillaribus terminalibusque, ovario glabro, stylo apice incrassato, stigmate penicillato.—Arbor 30-pedalis. Petioli 3—4-pollicares, seta decidua terminali, uti foliola glaberrimi læves. Glandulæ magnæ, oblongæ, verrucæformes. Stipulas non vidi. Foliola 1½—2½ poll. rigida, basi valde inæqualia. Pedunculi folio parum longiores, simplices v. subramosi, apice minute puberuli. Pedicelli demum pollicares. Bracteæ parvæ ante anthesin deciduæ. Sepala brevia ovato-orbiculata, ciliata. Petala ampla glabra. Stamina 10, fertilia. Antheræ subæquales apice breviter birimosæ, utrinque linea longitudinali pilosa notatæ. Ovarium subsessile pluri-ovulatum, stylo incurvo, supra ovarium non attenuato, dein incrassato apice oblique truncato stigmatifero et penicillato. Legumen lato-lineare, subrectum, planocompressum, rigide coriaceum, circa 3 poll. longum, nigrum, suturis incrassatis, bivalvatim dehiscens, uniloculare. Semina verticalia, transversa, obovata, funiculo brevi, e basi lata subtereti.—British Guiana. Schomburgk, n. 621.—This is evidently a second species of De Candolle's section *Baseophyllum*, which, with the stamina of Vogel's *Lasiorhegma*, has the fruit nearly of *Psilorhegma;* but is certainly distinct from both.

The three following new Brazilian species, remarkable for their very coriaceous strongly-nerved leaflets, belong also probably to *Baseophyllum*, though I have not yet seen the fruit of either.

C. *Blancheti;* glaberrima, petiolo brevissimo glandula verrucæformi, foliis 1—2-jugis late orbiculatis reniformibusve retusis basi inæqualibus rigidis, racemis brevibus terminalibus, pedicellis elongatis glabris, sepalis obtusis, ovario glabro, stigmate nudo.—Petiolus sæpius vix lineam longus, foliolis 1-jugis sessilibus, nonnunquam dum foliola bi-juga 2—3 lin. longus. Foliola $\frac{3}{4}$—1 poll. longa, 1—1$\frac{1}{2}$ poll. lata.—Serra Jacobina, Blanchet, n. 2649.

C. *brachystachya;* glaberrima, petiolo brevi glandula verrucæformi, foliolis bijugis obovato-rhombeis valde obliquis rigidis, paris infimi cauli approximatis basi oblique truncatis, supremis basi inæqualiter cordatis, racemis brevibus terminalibus, pedicellis elongatis glabris, ovario glabro, stigmate nudo.—Tejuco, *Herb. Acad. Petrop.*

C. *coriacea* (*Bongard, Ms.*)*;* procumbens, glaberrima, foliolis 1—2-jugis a caule distantibus obovatis obtusis basi cuneatis rotundatisve parum obliquis crassis rigidis, glandula ovata verrucæformi infra par infimum, pedicellis elongatis terminalibus brevissime subracemosis, sepalis acutiusculis, ovario glabro.—Inter Serra del Frio et Cachoeira, *Herb. Acad. Petrop.*

201. C. *hispida, Collad. Mon. Cass. p.* 118.—British Guiana. Schomburgk, (n. 269 in my set, but not in all).—French Guiana. Leprieur.

202. C. *lotoides, Humb. et Kunth.—Vogel, Syn. n.* 172. Savannahs, British Guiana. Schomburgk, n. 64, (in part), Bahia, Salzmann.—The form of the leaves in the two last species is very different, but there appears to be some confusion in the synonymy.

203. C. (*Absus*) *leiantha* (sp. n.); foliolis bijugis obovatis orbiculatisve ramis pedicellis floribus et legumine glaberrimis lævibus, stipulis subulatis persistentibus, racemis terminalibus. —This was sent by Schomburgk in some collections under

n. 64; but it is a smaller plant than *C. lotoides*, with slender pedicels and rather smaller flowers, and the total absence of glandular hairs on any part of the plant is too much at variance with that species to admit of uniting the two.

204. C. *viscosa*, *Humb. et Kunth.—Vogel*, *Syn. n.* 174.—Savannahs and edges of woods, British Guiana. Schomburgk, n. 186.

Allied to *C. fagonioides*, Vogel, is the following new species from the dry Campos on the Rio Pardo in Brazil;

C. *Camporum*, suffruticosa, ramis adscendentibus, petiolis pedicellisque viscoso-hispidis, foliolis bijugis parvis ovalibus obtusis utrinque glabris margine glanduloso-ciliatis, stipulis minutissimis, racemis terminalibus, sepalis hispidulis, leguminibus hispidis—Petioli longiores, foliola minora quam in *C. fagonioide.*—Communicated by the Imperial Petersburgh Academy.

The following is perhaps nearer allied to *C. cuneifolia*, (Vogel.)

C. *decumbens*, suffruticosa, ramis foliisque glaberrimis stipulis setaceis persistentibus, foliolis ($\frac{1}{2}$-pollicaribus,) 2—3-jugis late obovatis emarginatis coriaceis præter nervam centralem subaveniis, racemo terminali simplici glanduloso-hispido, sepalis membranaceis dorso subsetosis, leguminibus viscosis setoso-hispidis.—Brasilia, Pohl.

In Claussen's collection is the *C. setosa*, (Vogel), a fine species, which may be the same as *C. barbata*, (Nees et Mart.), and three remarkable new species having like it paniculate flowers and coriaceous leaves, viz.:—

C. *orbiculata;* ramis petiolisque viscoso-punctatis hirtellisve, foliolis bijugis orbicularibus glabris coriaceis margine incrassato glanduloso-punctato, racemis terminalibus paniculatis viscosis, legumine viscoso leviter pubescente.—Affine etiam *C. cotinifoliæ*, foliola 2—3 poll. diametro.

C. *Clausseni*, ramis petiolisque glaberrimis subglaucis, foliolis 2—3-jugis ovatis acutiusculis mucronatis glaberrimis coriaceis rigidis, racemis terminalibus paniculato-ramosis, rachi pedicellisque viscoso-puberulis, calyce membranaceo

subglabro, legumine viscoso.—Affinis præcedenti et forsan *C. ochraceæ.*—Foliola circa 1½ pollicaria.

C. *exsudans;* ramis petiolisque pube brevi viscosissima obtectis, foliolis subtrijugis ovatis oblongisve obtusis reflexo-mucronatis basi valde inæqualibus semicordatis subcoriaceis supra glabris viscoso-tuberculosis subtus pube densa tomentosis, racemis terminalibus paniculatis viscoso-villosis, bracteis minutis, calycibus viscoso-pubescentibus, legumine pubescente. —Affinis *C. crenulatæ* et *C. setosæ.*

Amongst the multijugous *Absi* with coriaceous leaves, the four following are new and remarkable species, all from Pohl's Brazilian collection.

C. *crenulata;* fruticosa, ramis foliisque glabris, foliolis (1—1½ pollicaribus) 6—8-jugis ovalibus obovatisve obtusis coriaceis margine incrassato minute crenulato, racemis terminalibus paniculatis glabris glutinosis, sepalis membranaceis dorso glutinosis, ovario glabro viscoso.

C. *densifolia;* fruticosa, ramis petiolisque glaberrimis glaucis, foliolis (6—10-linearibus) 5—7-jugis ovatis obtusis basi subcordatis reticulatis subcoriaceis glabris, racemis in panicula oblonga terminali dispositis viscosis subglabris, bracteis minutis, sepalis membranaceis glabriusculis, legumine (juniore) hispido.

C. *decrescens;* suffruticosa? erecta stricta, ramis foliisque glabris, foliolis (4—2-linearibus) 20—25-jugis ovato-lanceolatis oblongisve acutis mucronatis coriaceis, stipulis rigidis setaceis, racemis terminalibus subramosis glutinoso-hispidulis, bracteis minutis, sepalis membranaceis viscosis subhispidis, legumine viscoso-pubescente.—From Rainho.

C. *Pohliana;* suffruticosa? ramis petiolisque pubescentibus viscosis, foliolis (4—2-linearibus) 30—40-jugis ovali-oblongis obtusis basi inæquilateris utrinque pubescentibus, racemo terminali subsimplici viscoso-villoso, bracteis parvis setaceis, calycibus leguminibusque viscoso-villosis.—At Paracatu in the Serra do Chrystais.

I have also two or three new species of the same section *Absus*, allied to *C. pachycalyx*, (Vogel,) but they require too

much detail in their description and comparison with allied species for insertion here.

205. C. *diphylla, Lam.—Vogel, Syn. n.* 187.—Rocks of Aniparo on the Essequibo, and savannahs of the Upper Rupunoony. Schomburgk, n. 21. French Guiana, Leprieur, *Herb. Mus. Par. n.* 50.

206. C. *cultrifolia, Humb. et Kunth.—Vogel, Syn. n.* 188.—Dry savannahs, British Guiana. Schomburgk, n. 401.

207. C. *uniflora, Spreng.—Vogel, Syn. n.* 191.—Dry savannahs of the Rupunoony. Schomburgk.

208. C. *ramosa, Vogel, Syn. n.* 195.—Savannahs of the Rupunoony. Schomburgk, n. 190. Also Pernambuco, Gardner, n. 988, and in Pohl's, Mikan's, Salzmann's, Langsdorff's, and other Brazilian collections.—The petiolar gland is so very variable in the length and thickness of the stipes, that I am inclined to think this plant is but a variety of the *S. uniflora*, in which the gland is entirely sessile.—Gardner's n. 1574, from Ceará, is *C. curvifolia*, (Vogel.)

I have many new Brazilian species of this section *Xerocalyx*, and some very distinct *Chamæcristæ;* but the published species of these two groups are so numerous and often so much alike, that I do not venture to add any without detailed comparative descriptions too long for the present paper. Gardner's n. 26 from Rio Janeiro, and 967 from Pernambuco, are the *C. rotundifolia*, Pers., or *C. bifoliolata*, Collad., correctly referred to it by Vogel.—This, with the following species, and the other *Chamæcristæ* with large stipules and few leaflets, form a little group, which with the habit of *Xerocalyx*, has the calyx of *Chamæcrista.*

209. C. (*Chamæcrista*) *filipes* (sp. n.); caule petiolisque piloso-pubescentibus, stipulis late cordato-lanceolatis ciliatis, foliolis unijugis oblique obovato-oblongis semiovatisve obtusis glabris, pedicellis 1—3 folium subæquantibus subglabris, calycibus pilosis, legumine pubescente.—Herba annua bipedalis, ramis numerosis. Stipulæ 5—10 lin. longæ multinerviæ, subpellucidæ. Foliola circa pollicem longa, valde inæquilatera, plurinervia, nervis accessoriis omnibus a basi exteriori

nervi medii ortis, apice obtusa v. retusa, margine plano. Pedicelli filiformes, supra medium bracteolis 2 alternis parvis lanceolato-subulatis instructi. Sepala membranacea dorso pilosa.—Savannahs, about Fort St Joaquim. Schomburgk, n. 787.—Near *C. bauhiniæfolia*, (Humb. et Kunth), but the leaves are perfectly smooth and not waved on the margin.

210. C. *prostrata, Humb. et Bonpl.—Vogel, Syn. n.* 215.—Dry savannahs, British Guiana. Schomburgk, n. 840.—Bahia, Salzmann.

211. C. *flavicoma, Humb. et Kunth, Nov. Gen. v.* VI. *p.* 366?—British Guiana, Schomburgk, n. 176.—Vogel is probably right in considering this as one of the numerous forms of *C. glandulosa.*

212. C. *patellaria, DC. Vogel, Syn. n.* 241.—French Guiana. Leprieur, *Herb. Par. n.* 11.

213. C. *Æschynomene, DC. Vogel, Syn. n.* 240.—British Guiana. Schomburgk, n. 683.

214. C. *Parkeriana, DC. Vogel, Syn. n.* 242.—*C. Otterbeynii, W. Mey. Prim. Pl. Esseq. p.* 169?—Borders of Lake Amuca. Schomburgk, n. 720. Demerara. Parker.

215. C. *flexuosa, L.—Vogel, Syn. n.* 252.—British Guiana. Schomburgk, n. 59.—Pernambuco. Gardner, n. 989; and in several other Brazilian collections.

In the Paris herbarium, there is a singular plant received from Parà, which forms so distinct a genus of the tribe *Cassieæ*, connecting it on the one hand with *Swartzieæ*, through *Martiusia*, of which it has in some measure the habit, and on the other with some of the *Amherstieæ*, with a shortened calycine tube, that I subjoin the generic character with a short description.

Dicorynia.—Calyx ad basin partitus, laciniis 3 concavis valde imbricatis integris vel duabus apice bifidis. Petala 5, æstivatione imbricata, 2 exteriora sepalis subconformia, supremum late orbiculatum unguiculatum, lateralia oblique orbiculata breviter unguiculata. Stamina 2 inæquilonga, filamentis crassis, antheris crassissimis apice rima dehiscentibus. Ovarium sessile pauciovulatum. Stylus incurvus

acutus, stigmate minuto.—Species unica: *D. Paraensis.* Arbor? Rami glabri. Stipulas non vidi. Folia glabra abrupte v. impari-pinnata. Petiolus subteres, semipedalis. Foliola 2-3-juga petiolulata, pleraque opposita, ovata, obtuse acuminata, 3-5-pollicaria, basi rotundato-subcordata, penninervia, coriacea, supra nitida. Panicula terminalis, subcymosa, foliis brevior, multiflora. Pedicelli 4-6-lin., uti rachis paniculæ ferrugineo-tomentosi. Nec bracteas nec bracteolas vidi. Calycis tubus subnullus. Sepala 4 lin. longa concava, subcoriacea, intus glabra (colorata?), extus adpresse ferrugineo-pubescentia. Petala 2 exteriora antica cum sepalis diutius persistentia et illis adeo similia ut calycem 5-sepalum haberes, tamen e basi interiore calycis oriuntur et angustiora et minus coriacea sunt. Vexillum 4 lin. latum stipite sesquilineari. Alæ inter formas vexilli et petalorum inferiorum mediæ. Stamina glabra. Antheræ 2 lin. longæ, $1\frac{1}{2}$ lin. crassæ, biloculares, filamento altero $1\frac{1}{2}$ lin. altero fere 4 lin. longo. Ovarium tomentosum, apice attenuatum, stylo glabro. Legumen paullo post anthesin subovatum evadit, nervo utrinque notatum; adultum non vidi.

Tribe Swartzieæ.

The few species of *Swartzia* first known, appeared so different from any other genera then described, that they have hitherto been generally considered as forming a distinct suborder among *Leguminosæ;* but the addition of four genera, and a considerable number of species, of which forty-three or forty-four are now known, seems to have determined the place of the group as one of the tribes of *Cæsalpinieæ.* In the three genera *Martiusia, Zollernia,* and *Allania,* in which the number of petals is complete, although the æstivation be very irregular, I have never seen it papilionaceous. Usually one or both the lateral petals is outside, sometimes, however, the upper petal overlaps one of them on one side; and, in one flower, I found the upper petal entirely outside, as in *Papilionaceæ,* but then the others regularly overlapped each other by one side. All these irregularities are peculiar to *Cæsal-*

pinieæ. Where again in *Swartzia*, there is but one large petal, it is similar in form and situation to the single petal of many *Amherstieæ.* The stamina of *Martiusia*, and of *Zollernia*, are not unlike those of *Cassieæ*, and in their insertion they are scarcely more hypogynous than in that tribe, whilst in *Cordyla* and *Allania*, they are decidedly perigynous; their number in *Swartzia*, *Cordyla*, and *Allania*, is much beyond that of any other *Cæsalpinieæ*, out when once the number ten is exceeded, (as in several *Amherstieæ*,) no reliance can be placed on this character. The dehiscence of the calyx is remarkable; but the connexion in this respect through *Martiusia* and *Zollernia*, with *Poinciana* among *Eucæsalpinieæ*, and with many *Bauhinieæ* and *Cynometrieæ*, is very gradual.

216. Martiusia *excelsa*, *Gen. Nov.*—On the Essequibo, Rupunoony, and Quitaro. Schomburgk, n. 49 and 589.

Martiusia. *Char. Gen.* Calyx valvatim 5-partitus, laciniis per anthesin reflexis deciduis. Petala 5, æstivatione irregulariter imbricata, oblonga, supremo latiore sæpius interiore. Stamina pauca (4) subhypogyna, filamentis brevissimis, antheris crassis oblongis, longe acuminatis, apice biporosis. Ovarium sessile glabrum pauciovulatum, stylo longo incurvo, stigmate minuto terminali. Legumen .... Species unica *M. excelsa.* Arbor 50-pedalis. Rami glabri. Folia alterna, glabra, impari-pinnata. Stipulæ crassiusculæ, lineari-subulatæ, deciduæ. Foliola 5, alterna, ovali-elliptica, obtusa v. breviter acuminata, basi subcordata, 3-5-pollicaria, coriacea, penninervia, supra nitida, subtus opaca. Panicula terminalis ramosissima, floribunda. Bracteæ et bracteolæ in speciminibus nullæ, forte delapsæ. Alabastra 10 lin. longa, obliqua, basi supra gibba, longe acuminata. Calyx crassus, extus uti pedicelli et rachis racemorum velutino-tomentosus rufescens, per anthesin a basi ad apicem in valvas 5 rumpens. Petala crocea glabra, pollicaria, subæquilatera, patentia, basi in unguem brevem angustata. Antheræ inæquales 6-8 lin. longæ sæpissime 4, interdum vero 3 tantum. Ovarium breve in stylum gradatim attenuatum.

The genus *Martiusia*, or *Martia* of Leandro di Sacramento,

was founded only on an accidentally abnormal state of *Neurocarpum ellipticum*, and the Mexican plant, since added as a second species, is a *Galactia* in the same abnormal apetalous state so common among *Leguminosæ*. I am therefore truly happy to be enabled to dedicate this beautiful tree to the celebrated traveller and naturalist whose name is so intimately connected with the history, both physical and moral, of so large a portion of the South American continent. The *Martiusia excelsa*, belongs unquestionably to *Swartzieæ*, and is nearly allied to *Zollernia*, but it also tends to connect that tribe with *Cassieæ*, of which it has in some measure the corolla and stamina. The calyx is also more regular in its dehiscence, though still valvular.

217. Swartzia *triphylla, Willd. Spec.* II. *p.* 1220.—*Possira arborescens, Aubl. Pl. Guian.* II. *p.* 934. *t.* 355.—*Sw. parviflora, DC. Leg. Mem. p.* 403, *t.* 60?—Banks of the river Parine near the Meretani mountains, Schomburgk.—Although my single specimen has the leaves usually ternate, it has also two or three unifoliate leaves with a very short petiole; and in De Candolle's figure, there is one trifoliate leaf with a winged petiole. I am therefore induced to refer here the synonym of De Candolle above quoted.

Vogel is evidently right in referring *Riveria nitens* of Kunth, to *Swartzia*, and it appears very near to *S. triphylla*, if not the same species.

218. S. (*Possira*) *grandifolia*, (*Bongard Ms.*); petiolo apice subulato, foliolis 9—13 amplis oblongis obtusis acuminatisve supra pubescentibus subtus petiolis ramisque rufo-velutinis, racemis plurifloris, calyce crassissimo velutino quadrifido, petalo magno extus sericeo, staminibus majoribus circa 12, minoribus numerosissimis, ovario villoso, stylo elongato glabro.—Arbor 20—30-pedalis. Folia 1—2-pedalia. Foliola paris inferioris 2—3-pollicaria, majora sæpe semipedalia crassiuscula mollia. Petiolus inter foliola superiora alatus, inter inferiora angulato-teres. Racemi rameales, semipedales, simplices v. subramosi. Bracteæ breves ovatæ crassæ. Pedicelli crassi, 6—12 lin. longi, supra medium bracteolis 2 par-

vis crassis alternis v. oppositis instructi. Calyx globosus, striatus, per anthesin in valvas 4 crassissimas fere ad basin rumpens. Petalum sesquipollicem latum. Stamina glabra. —Barcellos on the Rio Negro, and on the Rio Parine. Schomburgk, n. 914. Received also from the Petersburgh Academy from the Rio Negro.

The larger stamina observable in several *Swartzias*, have been supposed to be the transformation of the four lower petals of a papilionaceous corolla; but their number in this and some other species, the gradual manner in which they pass into the smaller ones in some cases, and the circumstance that, where few, their number is usually odd, not even, are facts that seem to militate against that supposition.

219. S. (*Possira*) *latifolia* (sp. n.); petiolo aptero, foliolis 5—7 late obovatis orbiculatis ellipticisve obtusissimis coriaceis glabris supra nitidis subtus pallidis venosis ad venas subtomentosis, racemis ramealibus fasciculatis calycibusque ferrugineis, petalo glabro calyce duplo longiore, staminibus majoribus 5—6 minoribus numerosis, ovario tomentoso, stylo brevi, stigmate capitato.—Arbor 20—30-pedalis. Foliola 4—5-poll. v. paris inferioris 2—3-poll. lata. Stipulæ breves crassæ falcatæ. Racemi breves numerosi floribundi. Calycis piso communi parum majores. Bracteolæ nullæ.—Dry savannahs, British Guiana. Schomburgk, n. 724.

The four following new *Swartzias*, are all from the neighbourhood of Borba in Brazil, and were communicated to me by the Imperial Academy of Petersburgh.

S. *laxiflora*, (*Bongard Ms.*); stipellis breviter decurrentibus petiolis cæterum nudis ramulisque ferrugineo-pubescentibus, foliolis 9—11 oblongo-lanceolatis acuminatis basi subangustatis supra glabris nitidis subtus ferrugineo-pubescentibus, racemis laxis reflexis 3—5-floris, pedicellis apice bracteolatis calycibusque coriaceis ferrugineis, petalo calyce duplo majore extus villoso, staminibus majoribus circa 15, minoribus numerosissimis liberis, ovario longe stipitato velutino, stylo longiusculo.—Foliola 2—2½ v. vix 3 poll. longa. Calyces 4—5 lin. diametro.

S. *laurifolia;* petiolo aptero glabro, foliolis oblongo-ellipticis subovatisve obtusis v. brevissime et retuse acuminatis utrinque glabris coriaceis supra nitidis, racemis multifloris calyceque coriaceo-ferrugineis, bracteolis nullis petalo calyce plus duplo longiore glabriusculo, staminibus majoribus 5, minoribus numerosissimis longe monadelphis, ovario tomentoso, stylo brevi.—Foliola 3—3½ poll. longa. Racemi semipedales. Calyces fere 3 lin. diametro.

S. *corrugata;* petiolo aptero glabro v. leviter tomentoso, foliolis 9—11 amplis oblongo-ellipticis obtusis coriaceis bullato-corrugatis supra nitidis subtus tomento brevi ferrugineis, racemis multifloris, pedicellis ebracteatis calyceque coriaceo tomentosis, petalo glabro calyce parum longiore, staminibus majoribus 3, minoribus numerosissimis liberis, stylo brevissimo obtuso.—Foliola majora semipedalia. Calyces 2—2½ lin. diametro.

S. *leptopetala;* petiolo aptero glabro, foliolis 7—9 ovali-ellipticis obtusis vix coriaceis glabris, racemis brevibus multifloris, pedicellis ebracteatis calyceque coriaceo-tomentosis, petalo tenuissimo glabro orbiculato calyce vix longiore, staminibus majoribus 2—3, minoribus numerosissimis liberis, stylo ovario dimidio breviore obtuso.—Folia fere *Lonchocarpi latifolii.*—Foliola 3—5 poll. longa. Calyces vix 2 lin. diametro.

There is also in the Paris Herbarium a very remarkable species of the same section, there marked as having been gathered in Angola, viz. :—

S. *marginata;* petiolo aptero ramulisque ferrugineis, foliolis 7—9 oblongis obtusissimis retusisve supra glaberrimis subtus junioribus ferrugineo-pubescentibus adultis glabriusculis, racemis laxis 1—3-floris, calyce globoso pedicellisque ferrugineo-tomentosis, bracteis minutis, petalo amplo extus dense villoso, staminibus majoribus circa 5, minoribus numerosis, ovario glaberrimo, stylo brevi?—Foliola sesquipollicaria, supra in sicco purpurea, margine viridi circumdata. Calyces 4—5 lin. diametro. Stamina a majoribus ad minora fere

gradatim decrescentia, nec minora omnia postica ut in *Swartziis* plerisque, sed plura inter majora antice inserta.

In all the above species the calyx is globular, coriaceous, bursting irregularly into four reflexed valves of which one is often bifid, the ovary is stipitate, and ends gradually in a style sometimes very long, sometimes very short and incurved, but not suddenly deflected, the petal and larger stamina are always present, which several characters taken together appear to me better to distinguish the section *Possira*, than the sole reliance on the presence of the petal.

Besides the above eight species, I should refer to *Possira* the *S. simplicifolia*, (Willd.), with which I should join *S. ochnacea*, (DC.) judging from a West Indian specimen in fruit precisely similar to the figure in his *Mémoires sur les Legumineuses; S. dodecandra*, (Willd.); *S. elegans*, (Schott), which is Gardner's n. 358, a very variable plant in the size of the petal, and the same as *S. pulchra*, (Vogel), and *Mimosa triphylla*, (*Vell. Fl. Flum. v.* XI. *t.* 22); *S. grandiflora*, (Willd.), to which Vogel is right in referring *S. triphylla*, *β. grandiflora*, (of Raddi), and which is also the *Mimosa crocea*, (*Vell. Fl. Flum. v.* XI. *t.* 17); *S. Langsdorffii*, (Raddi), of which *S. Brasiliensis*, (Vogel), and *Mimosa pulchra*. (*Vell. Fl. Flum. v.* XI. *t.* 18.) are synonyms; *S. aptera*, (DC.) if I have correctly so determined a Brazilian specimen from the Petersburgh Academy; and *S. tomentosa*, (DC.) or Aublet's *Robinia Panacoco*.

I have not seen *S. myrtifolia*, (Sm.), *S. brachystachya*, (DC.), *S. robiniæfolia*, (Willd.), *S. macrophylla*, (Willd.), or *S. acuminata*, (Willd.), the three last described by Vogel, (*Linnæa*, XI. *p.* 171—173); but from the characters given I have no doubt they all belong to *Possira*.

S. *longifolia* (DC.); of which I have seen a Cayenne specimen in the Herbarium of the Paris Museum, must certainly be removed, as conjectured by De Candolle. I find the corolla pentapetalous and regularly papilionaceous; which character, with the others pointed out by De Candolle,

(*Mem. sur les Leg. p.* 406), in all the specimens I examined perfectly agree, clearly indicating its place among *Dalbergieæ*, where it must form a distinct genus, allied probably to *Dipteryx*, but differing especially in the calyx and other characters.

The two following *Swartziæ*, both new, form a very distinct section, or perhaps a genus, for which I should propose the name *Dithyria*. The calyx is ovate, membranous, and splits into two entire valves; there is one or sometimes two petals present, the stamens are all nearly alike with very long anthers, the ovary almost sessile with numerous ovules, and a long style with a capitate stigma.

S. *alterna;* petiolo aptero juniore puberulo, foliolis 4—7 alternis ovatis acuminatis basi angustatis glabris subcoriaceis, racemis brevibus laxis, pedicellis ebracteatis, calycibus glabris v. vix puberulis ovatis membranaceis per anthesin bipartitis reflexis, petalis 1—2 longe stipitatis, staminibus circa 15 subsessilibus, antheris linearibus, ovario sessili glabro, stylo elongato, stigmate late capitato.—Foliola adulta 3—4-pollicaria.—Barra do Rio Negro in Brasilia. Comm. ab Acad. Imp. Petropol.

S. *mollis;* petiolo aptero ramisque tomentoso-lanatis, foliolis 5—7 suboppositis ovatis obtusis junioribus utrinque molliter pubescentibus, racemis brevibus paucifloris, pedicellis elongatis ebracteatis calycibusque membranaceis ovatis molliter pubescentibus, petalo unico longe stipitato, staminibus circa 20 subsimilibus, antheris linearibus, ovario subsessili glabro, stylo elongato, stigmate late capitato.—Foliola adulta non vidi. Legumen glabrum, semipollicare, ventricosum, valvulis 2 coriaceis dehiscens, ut videtur pleiospermum at semina omnia delapsa.—Utinga, Prov. Bahia. Blanchet, n. 2774.

220. S. (*Tounatea*) *microstylis;* petiolo subnudo, foliolis 7 ovali-oblongis acuminatis coriaceis glabriusculis, racemis subramosis axillaribus ramealibusve tomentosis, petalo unico calycem coriaceum æquante, staminibus majoribus 3, minoribus numerosis, ovariis binatis tomentosis, stylo minuto de-

flexo.—Arbor. Rami glabriusculi. Petioli 4—5-pollicares supra subangulati. Stipellæ divaricatæ acutæ breves, superiores interdum breviter decurrentes. Foliola 2—4 poll. longa. Racemi 4—6 poll. Bracteæ minutæ, bracteolæ nullæ. Calyces tomentosi, magnitudine Pisi, valde inæqualiter rupti. Petalum orbiculatum acuminatum. Stamina majora calycem æquantia cum ovariis alternantia. Ovaria valde declinata.—On the Rio Quitaro, Schomburgk, n. 578.

I would comprise in the section *Tounatea*, all the species with the peculiar ovary described by De Candolle, whether with or without the petal. It would include amongst petaliferous species, (besides the above *S. microstylis*,) the *S. acutifolia*, (Vog.), to which may perhaps be referrible *Mimosa Pacoba*, (*Vell. Fl. Flum.* XI. *t.* 20.); *S. Flemmingii*, (Raddi), or *S. montana*, (Vogel); *S. multijuga*, (Vogel); and amongst those I have not seen probably also *S. lomatopus*, (Mart.); and *S. dipetala*, (Willd.); to which Vogel thinks *S. dicarpa*, (Moric.), may be referred. This species is evidently near my *S. microstylis;* but neither Vogel's nor Meissner's descriptions agree with Schomburgk's plant sufficiently to induce me to unite them.

Amongst the apetalous species of the same section *Tounatea*, the following new one is from Claussen's collection.

S. *pilulifera;* petiolo anguste marginato, foliolis 5 oblongis obtuse acuminatis emarginatisve basi angulatis coriaceis supra glabris nitidis subtus leviter tomentosis, racemis axillaribus terminalibusque laxe multifloris, calycibus pedicellisque villosis, petalo nullo, staminibus majoribus 2, minoribus numerosis inæqualibus, ovario sericeo-villoso, stylo brevissimo deflexo.—Foliola 1½—2 poll. Racemi 3—4 poll. Bracteæ minutæ, bracteolæ nullæ. Pedicelli 3—4 lin. Calyces magnitudine grani Piperis. Legumen ovoideo-globosum pubescens semipollicare, stipite 2 lin. longa.

The other apetalous species are *S. glabra* (Vogel), *S. pinnata* (Willd.), and *S. apetala* (Raddi), and probably also *S. sericea* (Vogel), and *Mimosa laxa* (*Vell. Fl. Flum. v.* XI. *t.* 25), neither of which I have seen. From the figure of the

latter, it must be near my *S. pilulifera*, but specifically distinct.

221. Allania *insignis, gen. nov.* On the Upper Essequibo and Rupunoony. Schomburgk, n. 524.

Allania. *Char. Gen.* Calyx cupulatus coriaceus irregulariter valvatim 4—5-lobus. Petala 5 ampla, æstivatione irregulariter imbricata. Stamina numerosissima inter se subsimilia cum petalis perigyna. Antheræ oblongo-lineares. Ovarium stipitatum pluri-ovulatum. Stylus filiformis basi incrassatus apice acutus, stigmate minuto. Legumen . . . . Species unica *A. insignis.* Arbor 20—30-pedalis. Ramuli crassi. Folia impari-pinnata, petiolo nudo semipedali v. longiore. Foliola 7—9, petiolulata, ovali- v. oblongo-elliptica, breviter acuminata, 4—5 poll. longa v. inferiora sæpius dimidio breviora, basi rotundata, coriacea, supra glabra nitida, subtus tomento brevissimo pallida v. subferruginea. Stipulæ v. stipellæ nullæ v. deciduæ. Racemi simplices subpedales, pluriflori, tomentosi. Bracteas non vidi. Pedicelli crassi, semipollicares, ebracteolati. Calyces crassi coriaceo-tomentosi, ante anthesin globosi 6—7 lin. diametro, per anthesin in laciniis 4 v. 5 inæqualibus fere ad medium fissi, in cupulam latam aperti. Petala sesquipollicaria, patentia, late obovato-orbiculata, basi cuneata, alba. Stamina plusquam 100; filamenta glabra petalis breviora; antheræ 3—4 lin. longæ, medifixæ. Ovarii stipes crassa, recta, 8—9 lin. longa, tomentosa. Ovarium in stipite subarticulatum, crassum, ovoideum, tomentosum. Ovula 3—4, sed in legumine adhuc juniore fere omnia jam abortiva et legumen monospermum evadit. Stylus rigidus, apice incurvo-hamatus. Legumen maturum non vidi.

This beautiful tree has the calyx and numerous stamens of *Swartzia*, but the insertion of the stamens is distinctly perigynous, as in *Cordyla*, and the number of petals is complete; thus forming a very distinct genus, which I have great pleasure in dedicating to the late Allan Cunningham, whose loss the botanical world has so recently had to deplore. His name, though so intimately connected with the Floras of

Australia and New Zealand, deserves however no less to be associated with the botany of South America, as is evinced by the important Brazilian collections deposited by him in the British Museum.

Tribe Amherstieæ.

222. Elizabetha *princeps, Schomb. Ms.*—Mount Roraima, Schomburgk.

Elizabetha. *Char. Gen.* Calyx coriaceus tubo infundibuliformi persistente, limbi laciniis 4 obtusis, æstivatione imbricata, suprema latiore. Corollæ petala 5, subæquilonga, æstivatione carinali, 4 inferiora oblonga, supremum intimum ovatum v. lanceolatum. Stamina 9, libera v. basi brevissime monadelpha, quorum 3 longissima antheris oblongis, sex sterilia filiformia corollam æquantia. Ovarium stipitatum pubescens stipite calycis tubo adnato. Ovula plura, anatropa. Stylus elongatus glaber, stigmate terminali crasso peltato-capitato. Legumen lignosum stipitatum lato-lineare falcatum, plano-compressum, sutura superiore incrassata marginata.—Arbores. Folia fere *Outeæ acaciæfoliæ*, v. *Heterostemonis mimosoidis*, alterna abrupte pinnata. Flores in spicas densas terminales aggregati. Bracteæ latæ coriaceæ. Bracteolæ coriaceæ basi connatæ, calycis tubum amplectentes.—E. *princeps*, foliolis 30—50-jugis oblongo-linearibus obtusis submucronatis basi obliquis glabris, floribus densissime globoso-spicatis.—Arbor excelsa, ramis divaricatis, ramulis rufo-villosis. Stipulæ lineari-cuneatæ membranaceæ connatæ 2—3-pollicares. Petioli rufo-villosi sæpe pedales. Foliola opposita ultrapollicaria suprema gradatim decurrentia. Stipellæ minutæ. Florum capitulum sessile. Bracteæ late orbiculatæ coriaceæ virides cum floribus sessilibus axillaribus solitariis densissime imbricatæ. Bracteolæ usque ad medium connatæ, virides, tomentoso-pubescentes, in sicco ferrugineæ. Calycis tubus basi longe cylindricus apice cupulatus, limbus patens. Petala roseo-alba. Filamenta glabra. Legumen velutinum 4—6-pollicare.

223. E. *coccinea*, (Schomb. Ms.); foliolis 3—6-jugis,

obovato-oblongis obtusissimis retuso-emarginatis glabris, floribus oblongo-spicatis.—Arbor 20—30-pedalis. Folia fere *Outeæ multijugæ*. Stipulæ in specimine unico desunt. Capitula florum minus densa quam in *E. principi*, bracteæ angustiores. Flores coccinei. Calycis tubus basi breviter cylindricus dein oblongo-campanulatus. Filamenta fertilia pilosula. Legumen velutinum, coccineum.—British Guiana, Schomburgk.

These two trees, dedicated by M. Schomburgk to H. R. H. the Princess Royal of Prussia, are described by him as objects of great beauty; they form the connecting link between the genus *Brownea*, the rose of the West Indies, and Desfontaine's *Heterostemon*, and indicate clearly the place of *Brownea* amongst *Amherstieæ*.

224. Heterostemon *mimosoides*, *Desf. Mém. Mus. v.* IV. *p.* 284. *t.* 12. *DC. Prodr. p.* 488.—On the Rio Negro, Schomburgk, n. 869, received also from the same locality from the Petersburgh Academy.

225. Eperua *falcata*, *Aubl. Pl. Guian.* I. *p.* 369. *t.* 142.—*DC. Prodr.? p.* 510.—Legumen 8—10-pollicare.—Banks of the Essequibo and Rupunoony. Schomburgk, n. 515.—French Guiana, Perrottet.

226. Parivoa *grandiflora*, *Aubl. Pl. Guian.* II. *p.* 757. *t.* 303.—*DC. Prodr.* II. *p.* 510.—Banks of the Essequibo and Rupunoony. Schomburgk, n. 517.

227. Campsiandra *comosa*, gen. nov.—Apicaro of the Creoles; Uluri Wallaba of the Arrowaks.—Banks of the Essequibo. Schomburgk, n. 13, and 296.

CAMPSIANDRA. *Char. Gen.* Calycis tubus campanulatus, limbus subæqualiter 5-fidus. Petala 5 parum inæqualia, æstivatione imbricata subcarinali, cum staminibus ad apicem tubi calycis inserta. Stamina plura (15—20) longe exserta, antheris parvis ovatis. Ovarium stipitatum pluriovulatum, stipite libero. Stylus longissimus, filiformis. Stigma minutum, terminale. Legumen longissimum subrectum, planocompressum, tenuiter coriaceum, indehiscens?—*P. comosa;* foliolis 5—9, calycibus pedicello parum brevioribus.—Arbor

elata. Rami glabri. Folia alterna impari-pinnata glabra. Stipulæ breves lineares crassæ deciduæ. Petioli angulati v. subalati 4—5-pollicares. Foliola 5—9, oblongo-elliptica, acuminata, basi rotundata, 3—5-pollicaria, coriacea, supra nitida. Racemi breves, dense subcorymbosi ad apices ramorum paniculatim aggregati, rachi ferrugineo-tomentosa. Pedicelli circa ½ poll. longi aggregati uniflori, glabriusculi v. tomentosi. Bracteæ parvæ deciduæ. Bracteolas non vidi. Calyx crassiusculus, tubo 2½ lin., limbo 1½ lin. longo. Petala semi-pollicaria lutea. Filamenta filiformia glabra corolla duplo terve longiora in alabastro replicata. Ovarium glabrum. Ovula circa 6. Legumen nondum maturum jam ultrapedale, 2 poll. latum, valvulis sese arcte adhærentibus glabrum.

This genus, allied in some respects to *Tachigalia*, is a very distinct one in habit and character. A second species *Campsiandra laurifolia*, gathered on the Rio Negro, has been communicated to me by the Imperial Academy of Petersburgh, under the name of *Inga? laurifolia*, (Bongard, Ms.) It is very like *C. comosa*, but the leaflets are (in my specimen) 13 in number, rather narrower and less coriaceous, and with more numerous parallel transverse veins, and the flowers, especially the calyces, are much smaller.

228. Tachigalia *pubiflora* (n. sp.); ramulis petiolis spicisque vix secundis tomentosis, foliolis 2—4-jugis oblongis acuminatis supra glabris, subtus sericeo-tomentosis, calycibus molliter tomentosis.—Habitus *T. paniculatæ*. Petioli nonnunquam acute angulati ut in *T. paniculata* at sæpius obscure trigoni. Sepala latiora.—Banks of the Essequibo. Schomburgk, n. 43.

229. Outea *acaciæfolia* (n. sp.); ramulis foliisque glabris, foliolis 20—30-jugis oblongo-linearibus emarginatis basi inæquilateris, racemis brevibus axillaribus recurvis villosis.—Arbor 20—30-pedalis. Folia *Heterostemonis*. Racemi vix sesquipollicares. Bracteas non vidi. Bracteolæ ovatæ membranaceæ villosæ calyce longiores. Pedicelli breves. Flores roseo-albi. Calyces membranacei, lacinia suprema integra.

Petalum supremum calyce duplo longius, ungue lata, lamina orbiculata undulata, 4 inferiora vix lineam longa linearia.—Legumen orbiculatum obliquum plano-compressum, glabrum, læve.—On the Essequibo and Rupunoony. Schomburgk, n. 521.—Santarem in Brazil. (*Herb. Mus. Imp. Petropol.*)

230. O. *multijuga, DC. Prodr.* II. *p.* 510.—Foliola 4—7-juga. Stamina 3, basi pilosa. Petalum unicum vidi, inferioribus omnina deficientibus.—Rio Branco. Schomburgk, n. 777.—French Guiana. Martin.

231. Vouapa *staminea, DC. Prod.* II. *p.* 511.—British Guiana. Schomburgk, n. 511.

Allied to this is *V. pendula*, or *Macrolobium pendulum*, (*Vogel, Linnæa,* XI. *p.* 412), which is among Perrottet's plants from French Guiana, and which I have also received from the Petersburgh Academy, gathered on the Rio Negro; it has, however, smaller narrower leaves, with longer points, and the ovary and fruit are smooth.

232. V. *bifolia, Aubl. Pl. Guian.* I. *p.* 25. *t.* 7 ?—On the Essequibo. Schomburgk, n. 10.—I have several specimens before me which may not all belong to the same species, but which I am not at present able to characterize as distinct; viz.: 1. Martin's specimens from French Guiana, which most resemble Aublet's figure; 2. Schomburgk's, which have leaves rather blunter and thicker and the spikes longer; 3. a Parà specimen in the Paris herbarium, with much longer points to the leaves and short spikes. They have all a pubescent ovary and the bracteæ are somewhat coriaceous, though less so than in Salzmann's Bahia specimens, which appear to be the *Macrolobium hymenæoides*, described by Vogel (*Linnæa*, XI. *p.* 413).

The genera *Outea* and *Vouapa* have been often united into one, under the name of *Macrolobium*, and as often separated upon various grounds. It appears to me that they are really distinct, although not in the flower; the pod of *Outea* being obliquely orbicular with the margin equally thick all round, and that of *Vouapa* oblong, somewhat falcate, with the upper margin very much thickened. The foliage in the

two genera is very different. The *Vouapa Simira* of Aublet, is however evidently different from both. Its flower is not known, but from the figure of the foliage and fruit I should refer it to a species of *Peltogyne*, which is in several Cayenne collections.

233. Peltogyne *paniculata* (sp. n.); foliolis longiuscule petiolulatis acuminatis coriaceis glabris, floribus paniculatis, calycibus cano-tomentosis, staminibus corollam parum excedentibus, leguminibus demum glabratis.—Arbor excelsa. Rami glabriusculi. Petioli fere pollicares, petioluli 3—4 lin. Foliola more generis unijuga, fere 3—4-pollicaria, ovali-oblonga, falcato-incurva, valde inæquilatera. Panicula ampla floribunda. Bracteæ et bracteolæ minutæ deciduæ. Calycis tubus laciniis subæquilongus. Petala ovali-oblonga, calycem subæquantia, albida. Stamina 10, glabra, parum inæqualia, inferiora calyces parum superantia. Ovarium villosum. Legumen (nondum maturum), oblique rhombeum, stipitatum, plano-compressum, coriaceum.—High lands adjoining lagoons near the Rio Negro. Schomburgk, n. 908.

234. P. *pubescens* (sp. n.); foliolis breviter petiolulatis obtusis coriaceis junioribus subtus pubescentibus, floribus paniculatis, calycibus tomentoso-pubescentibus villosisve, staminibus corolla duplo longioribus, leguminibus pubescentibus.—A tree, much resembling *P. paniculata*, but the leaves are much smaller, the panicles more downy, the flowers larger and the stamens much longer.—Skirts of savannahs, British Guiana. Schomburgk, n. 88 and 791.

TRIBE BAUHINIEÆ.

235. Bauhinia (*Pauletia*) *macrostachya* (sp. n.); ramulis petiolisque minute tomentosis, foliis ovatis basi leviter et late cordatis 9-nerviis ad medium bilobis, lobis lanceolato-ovatis subdivergentibus obtusiusculis, supra glabris nitidis subtus ferrugineo-tomentosis, racemis elongatis laxis multifloris, petalis linearibus, staminibus omnibus fertilibus, alternis minoribus, legumine leviter tomentoso.—Affinis *B. pictæ* et *multinerviæ*, (Humb. et Kunth), et *Pauletia grandifoliæ*, (Bongard).

Frutex 10—12-pedalis. Folia 2—4-pollicaria, lobis apice potius lanceolatis quam vere acuminatis, consistentia subcoriacea. Stipulæ nullæ v. minutissimæ, subspinescentes. Racemus ultrapedalis. Bracteæ et bracteolæ minutæ. Pedicelli crassiusculi, 3—4 lin. longi. Calyx basi obliquus, ferrugineus, tubo 4 lin. longo 10-striato, laciniis 9—10 lin. longis. Petala calyce parum breviora, angustissima, ad apicem tubi calycis inserta. Filamenta glabra. Antheræ lineares, magnæ. Ovarium ferrugineum, stipite a calyce libero glabro. Stigma magnum, obliquum. Legumen (nondum maturum) jam 4—5-pollicare, longe stipitatum, circa 20-spermum.—Woods skirting savannahs, British Guiana. Schomburgk, n. 71.

The form of the flower and fruit in the various groups collected under the name of *Bauhinia* is so very different, that it seems impossible to retain the genus entire; but in dividing it, it is to the *Pauletias* of authors that the Linnæan name must be given, as pointed out by Vogel, (*Linnæa*, XIII. *p.* 296). *Casparia* of Kunth must probably be adopted under that name, and the East Indian species appear to form two or perhaps three very distinct genera. The *Caulotreti* of DC., or *Bauhinia* of Kunth and of Bongard, are identical with Raddi's *Schnella*, a name which will, of course, be adopted.

236. Schnella *rubiginosa.—Bauhinia rubiginosa, Bongard, Bauhin. p.* 4.—Banks of the Rupunoony. Schomburgk, n. 115. Common in Brazil; it is Gardner's n. 987, from Pernambuco, and n. 1566 from Ceará; and is also in Pohl's, Claussen's, and several other collections.

237. S. (*Caulotretus*), *splendens* (sp. n.); scandens, cirrhosa, ramulis subteretibus, junioribus ferrugineis, foliis basi cordatis, foliolis distinctis semiovatis acuminatis 3—4 nerviis parallelis supra glabris nitidis subtus tenuiter tomentosis aureo-nitentibus, calycis dentibus brevibus latis, petalis extus villosis.—Bauhinia splendens, *Humb. et Kunth, Nov. Gen. et Sp. Amer. v.* VI. *p.* 321.—Petiolus 4—8 lin., foliola (in ramulis floriferis), 1½—2 poll. longa. Racemi terminales, 2—3 poll. longi, ferruginei. Bracteæ minutæ. Pedicelli

vix 1 lin. longi. Calyces inflato-campanulati, nervati, 3 lin. longi. Flores roseo-albi. Petala ad basin calycis inserta, calyce fere duplo longiora, 2 infima, æstivatione exteriora, unguiculata oblique obovato-orbiculata extus et ad unguem villosissima, 2 lateralia, æstivatione intermedia, infimis conformia, at parum minora, supremum intimum carinæforme, complicatum, dorso convexum, apice acuminatum, extus villosum, antheras et stigma fovens. Stamina 10 fertilia glabra, corolla breviora. Ovarium villosissimum, ovulis circa 4. Stylus brevis rectus, fere glaber. Stigma crassum terminale obliquum. Legumen non vidi.—Barcellos on the Rio Negro. Schomburgk.

238. S. (*Tylotia*) *brachystachya* (sp. n.); scandens, cirrhosa, ramulis subteretibus, junioribus ferrugineo-pubescentibus, foliis late orbiculatis breviter v. vix ad medium bilobis 9-nerviis basi cordatis, lobis rotundatis obtusissimis, supra glabris, subtus adpresse pubescentibus, aureo-nitentibus, racemis brevibus subcorymbosis ferrugineo-villosis, bracteis dentibusque calycinis subulatis, petalis extus villosis.—Petiolus subpollicaris. Folia 1½—2 poll. longa, 2 poll. lata. Stipulæ hinc inde persistentes, orbiculatæ. Pedicelli inferiores semipollicares, bractea paullo breviores. Calyx campanulatus dense nitenti-villosus, apice breviter bilabiatus, dentibus in labio superiore 2, in inferiore 3, tenuiter subulatis, calyce ipso æquilongis. Petala et genitalia iis *S. splendentis* similia, nisi petala longiora angustiora, vexillum minus acuminatum apice subexplanatum. Stigma vix obliquum.—On the Rio Quitaro. Schomburgk, n. 565.

239. S. (*Tylotia*) *longipetala* (sp. n.); scandens, subcirrhosa, ramulis subteretibus, junioribus ferrugineo-pubescentibus, foliis lato-ovatis suborbiculatis 13—15-nerviis basi profunde et late cordatis ad medium bilobis, lobis ovatis acutiusculis obtusisve supra glabris subtus tenuissime tomentosis, racemis elongatis spiciformibus ferrugineo-pubescentibus, pedicellis calyce brevioribus, bracteis bracteolis dentibusque calycinis subulatis, petalis extus villosis.—Folia 2—4 poll. longa et lata. Pedicelli vix 2 lin. longi. Bracteæ

semipollicares. Calyces *S. brachystachyæ.* Petala infima pollicaria anguste obovato-oblonga, basi longe angustata, lateralia angustius oblonga; vexillum oblongo-lineare, basi et medio complicatum, apice explanatum. Stigma obliquum. —Pacaraima and Parime mountains. Schomburgk.

240. Etaballia *Guianensis.* Gen. Nov.—On the Essequibo. Schomburgk, n. 169 and 706.

ETABALLIA. *Char. Gen.* Calyx tubulosus, apice breviter 5-dentatus subbilabiatus. Petala 5, ad basin calycis inserta, longissime linearia, æstivatione inflexa, imbricata. Stamina 10, monadelpha, alterna breviora. Antheræ ovatæ. Ovarium subsessile, villosum, 2—3-ovulatum. Stylus brevis. Stigma oblique capitatum. Legumen . . . .—*E. Guianensis.* Arbor. Rami ramosissimi, glabri. Folia simplicia (unifoliolata), brevissime petiolata, ovato-oblonga, breviter et acute acuminata, basi rotundata v. cordata sæpe obliqua, 2—4 poll. longa, penninervia, coriacea, utrinque glabra vel subtus ad venas sparse pubescentia. Spicæ florum axillares et terminales, numerosæ, densæ, 2—3-pollicares. Bracteæ parvæ, ovato-orbiculatæ, concavæ; bracteolæ minimæ, lanceolatæ. Flores sessiles. Calyx 2 lin. longus, ferrugineus, dentibus minutis. Petala lutea, pollicem longa, medio vix lineam lata, basi angustata, omnia subsimilia. Stamina calycem æquantia, fere ad apicem monadelpha. Stylus calyce parum brevior.

This is, according to Schomburgk, a most beautiful tree, almost covered with bright yellow flowers, and is called by the natives *Etabally*, on account of its frequency at the cataracts of that name. It forms a genus of *Bauhinieæ;* allied to *Schnella* in its flowers; but very different in the foliage. I have a second species, *E. macrophylla,* from the island of St Vincent, which has blunt leaves 8 or 9 inches long, and the flower-spike very lax.

TRIBE CYNOMETREÆ.

241. Cynometra *bauhiniæfolia,* (sp. n.); ramulis puberulis, foliolis unijugis late semiovatis semiorbiculatisve obtusis valde

inæquilateris 2—3-nerviis glabriusculis, florum fasciculis axillaribus, pedunculo communi brevissimo.—Arbor, ramis tenuibus ramosissimis. Ramuli, pedicelli, petioli et nonnunquam nervi foliolorum pilis brevibus subglandulosis pubescentes. Folia iis *Bauhiniarum* bifoliolatarum similia. Petiolus 2—3 lin. Foliola 1—1½ poll. longa, ½ poll. lata, nervo majore lateri interiori approximato. Pedicelli vix ½ poll., ad axillas bractearum ovatarum, concavarum, imbricatarum nati. Sepala 4, membranacea, decidua. Petala 5, parum inæqualia, cum staminibus disco crassiusculo subperigyno inserta. Ovarium pubescens 1-(vel 2-?) ovulatum. Stylus glaber inflexus, stigmate magno capitato. Legumen, nondum maturum, 3 lin. longum et latum, plano-convexum, carnosum, extus verrucosum pubescens.

Besides the above, I have seen the three following American species in the Paris Herbarium:—

C. *crassifolia;* foliolis unijugis ovatis emarginato-acuminatis valde inæquilateris penninerviis coriaceis glaberrimis, fasciculis florum axillaribus, pedunculo communi brevissimo. —Foliola 2½ poll. Flores majores quam in affinibus.—"E Brasilia."

C. *marginata;* foliolis unijugis ovali-oblongis emarginato-acuminatis valde inæquilateris penninerviis vix coriaceis glabris, floribus subracemosis axillaribus, pedunculo communi pedicellis multo breviore.—Foliola 1½-pollicaria, acumine sinu latiusculo emarginato, arista minima intra emarginatura. Pedicelli semipollicares. Legumina vix 2 lin. longa, fusco-villosa.

C. *racemosa;* foliolis unijugis oblongis obtusis valde inæquilateris penninerviis coriaceis glabris, racemis axillaribus foliis vix brevioribus, pedunculo pedicellisque ferrugineis.—E Guiana Gallica?

These American *Cynometræ* are precisely similar to the Asiatic and African decandrous ones, in the flower and inflorescence; but they may perhaps be distinguished as a section by their small nearly orbicular fruit. I have not indeed seen it ripe, but in three of the above four species, it

appears to have nearly attained its full size, and is never more than three lines long.

Vogel has described a *Cynometra Americana*, (*Linnæa, v.* X. *p.* 602), from St. Domingo; but it appears different from any of the foregoing.

242. Copaifera *pubiflora* (sp. n.); foliolis 2—3-jugis ovatis valde inæquilateris subincurvis brevissime emarginato-acuminatis impunctatis, pedunculis floribusque tomentosis.—Species nonnullis Brasiliensibus similis, sed cum nulla diagnosi Heyneana in omnibus convenit. Foliola distantia, majora quam in *C. nitida*, minora quam in *C. Jacquini.* Racemi ramosissimi.—British Guiana. Schomburgk, n. 839.

243. Crudya *Parivoa*, *DC. Prodr.* II. *p.* 520.—French Guiana, Leprieur. Herb. Par. n. 62.

In Martin's Guiana collection is the following new species, also communicated to me by the Museum of Paris.

C. *bracteata;* glaberrima, foliolis 5—7 ovatis acuminatis coriaceis supra nitidis, bracteis bracteolisque ovatis flores subæquantibus, ovario ad suturas villoso cæterum glabro.

The *Crudya aromatica*, has by some error, clerical or typographical, been described by De Candolle as trifoliolate instead of unifoliolate.—A fine new species of this genus has been found by Heudelot in tropical Africa.

Tribe Dimorphandreæ.

244. Mora *Guianensis.*—*Benth. in Trans. Soc. Linn. Lond.* XVII. *p.* 210. *t.* 16, 17.—British Guiana. Schomburgk, n. 148 and 496.

245. Dimorphandra? *macrostachya* (sp. n.); pinnis 10—12-jugis foliolis 20—30-jugis oblongo-linearibus obtusis basi obliquis coriaceis glabris, spicis paucis longis crassis, ovario hirsuto.—Mount Roreima. Schomburgk, n. 1045.—Arbor. Ramuli crassi. Folia rigida coriacea, petiolo communi angulato 6—8-pollicari, pinnæ 4—5 pollicares, foliola vix semipollice longiora. Spicæ ad apices ramorum 5—6 paniculatim dispositæ 8—10 pollicares densæ. Flores numerosissimi, minores quam in *Mora excelsa*, majores quam in *Dimorphandra exaltata.* Rachis crassa. Pedicelli vix 1 lin. longi. Calyx

1 lin. longus fere ad medium in dentes 4 v. 5 ovatos obtusos fissus. Petala 5, imbricata? crassa concava glabra, calyce duplo longiora. Stamina 5 fertilia, 5 sterilia filiformia, omnia glabra. Ovarium sessile, pilis ferrugineis obtectum. Stylus brevis glaber. Stigma obtusum.

In the specimens I have seen of this plant, the flowers, numerous as they are, are every one of them partially destroyed by worms; so that I am not quite certain of the generic character, and the less so, as I have not seen the fruit. When better known, it may turn out to be a distinct genus. The inflorescence is that of *Mora* and of *Pentaclethra*, the foliage is nearest that of *Dimorphandra*, the flowers very near those of both *Mora* and *Dimorphandra*. The sterile alternate stamens are nearly the same as in the three genera, which form the connexion between *Cæsalpinieæ* and *Mimoseæ; Mora* and *Dimorphandra* having decidedly the æstivation of *Cæsalpinieæ*, whilst *Pentaclethra* has that of *Mimoseæ*.

Of true *Dimorphandræ*, I have a new Brazilian species, allied to the only one hitherto known, *D. exaltata*, of Schott. I therefore subjoin short specific characters for both of them.

D. *exaltata* (*Schott, in Spreng. Syst. App. p.* 404); pinnis 5—6-jugis, foliolis 8—10-jugis ovato-lanceolatis oblongisve acutis supra glabris nitidis subtus pubescentibus, spicis numerosis oblongo-cylindricis multifloris corymboso-paniculatis. —Brazilia. Schott.

D. *mollis;* pinnis 6—12-jugis, foliolis 12—20-jugis ovali-oblongis obtusis utrinque petiolis ramulis pedunculisque molliter pubescentibus villosisve, spicis numerosis oblongo-cylindricis multifloris corymboso-paniculatis.—Brazil (Minas Geraes). Pohl. Claussen.

I saw in Richard's herbarium at Paris, specimens of a plant from French Guiana which appeared to be either *D. macrostachya*, or a species very near to it.

Since the printing of the sheet which contains the description of *Martiusia* (*p.* 84,) Mr Bentham had received his set of Mr Gardner's Brazilian plants of the province of

Piauhi; and he finds among them a second most beautiful species of the Genus, which enables him to describe the fruit as follows:—

Legumen sessile oblongum subobliquum plano-compressum coriaceo-membranaceum indehiscens reticulatum et longitudinaliter binerve, (sutura nempe utraque ut in Meyoneuro in alam expansa.) Semen unicum plano-compressum rhombeum, fere ad apicem loculi appensum fasciculo elongato, cotyledonibus tenuibus, radicula brevi recta.

The species from Piauhi, Mr Bentham thus characterizes:—

Martiusia *parvifolia;* foliolis 7—9-oblongo-ellipticis brevissime retuse acuminatis basi cordatis.—Foliola pleraque vix bipollicaria. Panicula laxior, floribus paucioribus, longius pedicellatis quam in *M. excelsa.* Alabastra longius acuminata glabriora. Sepala in utraque specie intus sericeo-villosa. Antheræ sæpius 5, quarum 3 longe acuminatæ, omnes ut in *M. excelsa* apice in appendiculam brevem triangularem extus productæ, intus biporosæ. Legumen 4—5-poll. longum, $1\frac{1}{2}$—2-poll. latum tenuissime pubescens, valvulis in medio legumine loculum $1\frac{1}{2}$-poll. longum $\frac{3}{4}$-poll. latum formantibus, cæterum arcte connatis.—Piauhi, Brazil. Mr Gardner.

(To be continued in a future No.)

V.—BOTANICAL INFORMATION.

[We had the gratification, in the *Companion to the Botanical Magazine*, of giving some extracts from the letters of a most intelligent botanical friend, detailing his excursions in various parts of the German dominions, and illustrative of the productions of the countries he visited, and the state of botanical science in the great towns. We have now the pleasure of continuing those extracts;—the first letter as still relating to Germany, and the following ones to France and the Pyrénées.]

"On the 6th of May, we quitted Vienna, and proceeded to Baden, where we staid three days, and made a little botanical excursion in its vicinity. Some rare plants, among them fine specimens of *Orchis pallens*, gave us reason to hope

that we should find the vegetation equally rich when, at a still more advanced season, we proceeded farther southward; but we had scarcely crossed the ridge of hills which separates Austria from Styria, when we found ourselves in the midst of winter again. There were scarcely any leaves on the trees; and cold, windy, and rainy weather prevailed, which continued during the two days we spent at Gratz. Here Dr Unger is professor of Botany at the Lyceum of Natural History and Technology, established by the Archduke John, and after him called 'Joanneum.' In the museum, which is kept in excellent order, there is, as may be supposed in a newly founded institution, a little of every thing, without any collection of importance except what illustrates the Geology of Styria; but the garden pleased me much from the arrangement of the plants in clumps according to their natural affinities; instead of the straight rows, according to the Linnæan system, which one usually sees, and which to me are not nearly so convenient as even the alphabetical order. Dr Unger himself is a young Botanist of considerable promise, especially in what relates to Vegetable Physiology and Anatomy, the subject to which he chiefly directs his attention. He has already published a paper on the effect of climate on plants, and another, the precise nature of which I forget, is about immediately to appear in the Annals of the Vienna Museum.

"From Gratz to Laibach, we passed through a beautiful country, rich and varied to the eye, and abounding also in vegetable productions; but the latter were not in a sufficiently advanced state to make it worth while for me to stop on this occasion. At Laibach, Dr Graf, an apothecary, is very zealous in pursuit of European Botany, and has collected a considerable stock of the rarer Carniolian plants: during the two hours I spent with him he kindly presented me with some of the best of these, requesting that I would share them with yourself on my return, and, though he expressed no wish for any thing in requital, I know that he would be glad to receive some of the less common plants of Scotland.

"Between Laibach and Adelsberg I found vegetation rather forwarder, and I gathered *Scopolia Carniolica*, *Thlaspi præcox*, *Euphorbia Carniolica*, and other good plants peculiar to the country. At Adelsberg, we got into the rocky desert, called the Karst, and found ourselves at an elevation where the peculiar vegetation of the district was scarcely out; indeed, the *Quercus Cerris* (which is the common *Oak* there) had not expanded its foliage, and I saw *Loranthus Europæus* growing upon it but once or twice, and then, at a height which rendered it inaccessible to me. As a natural curiosity, however, the stalactitic grotto of Adelsberg far surpasses in beauty and extent any thing of the kind I had any idea of. It was not till we had passed Optschine, and crossed the ridge of the hills above Trieste, that the country was again clad with spring verdure.

"We arrived at Trieste, on the 18th of May, and from that time to the 25th, when we came hither (to Venice), there was not a day during which rain did not fall for at least half of its hours. I did not, however, wholly give up herborizing, but made two excursions in company with MM. Tommasini and Biasoletti, one was to the Monte Spaccato above the town, the other to Contobello, three miles along the coast to the N.W. Both these localities, which are visited by all Botanists who come to Trieste, produce many of the rarest plants of the Karst district. The excessive rains that have fallen this season, have given the rocky pastures an unusual richness of verdure and variegated them with large masses of *Narcissus poeticus*, *Orobus versicolor*, *Gentiana angulosa*, various species of *Cytisus* and *Genista*, *Senecio Scopolii*, *Fritillaria Pyrenaica*, and many other highly ornamental flowers, and each time I returned laden with plants, which if not absolutely new to me, I had never before seen in a growing state.

"Of the two friends I have just mentioned, the first, M. Tommasini, is employed in one of the government offices, a highly gentlemanly and well informed person, suffering under a heavy domestic bereavement and also tried by feeble health, but a zealous botanist, thoroughly acquainted with the pro-

ductions of this country and of Dalmatia, where he resided for many years. The other, Dr Biasoletti, an apothecary, is perhaps already known to you as an algælogist, to which branch of science he is quite devoted, and has done much in investigating the Algæ of the Adriatic. He also succeeded in obtaining for the town of Trieste the gift of a small piece of ground as a Botanic garden about nine years ago, and has managed it ever since. Unfortunately the sum of £30 or £40 per annum is all that is allowed for keeping it up, so that even with the addition of what Dr Biasoletti spends upon it out of his own pocket, he can do little more than cultivate a collection of indigenous plants. Of these, however, and especially of Istrian and Dalmatian ones, there is a very perfect and interesting set.

"We came to Venice from Trieste by steam, and my time has of course been more occupied in sight-seeing than in Botany, nor could much of interest in the latter department be expected in a city consisting wholly of buildings, and of water. I made, however, an excursion to the islands that separate the lagunas from the sea, and got a few rather uncommon plants; and the Botanic garden of Venice is quite a curiosity of itself, for with a very small extent of ground, no person to take interest in its welfare, and but little communication with horticulturists or other gardens, there exists a very tolerable collection, kept in good order by the two Rucchieris, father and son. I also visited Padua, that I might see Visiani and the Botanical garden. This is the oldest in Italy, and belongs to a decaying university; besides having been long under the care of a professor, who allowed it to fall into disorder; but his successor, Visiani, a young Dalmatian, with whom I had spent several pleasant mornings at the Vienna Meeting of Science, is an active and well informed person, particularly conversant with the Botany of southern Europe. As may be expected, the garden is most antique in its style; and the work of renovation, now proceeding under the new professor's auspices, rather increases than diminishes, for the present time, its confusion. The prin-

cipal curiosities are some aged trees, particularly *Magnolia grandiflora*, *Platanus orientalis*, some *Cratægi*, a very fine *Lagerstroemia Indica*, and a *Quercus coccifera* about thirty feet high, with a stem a foot in diameter. In the south of France, where this species of *Quercus* is the most common of shrubs, I never met with it half so high. Visiani's assistant is a young Paduan, named Meneghini, who lately published a memoir on the structure of the stem in the *monocotyledonous* plants.

"We are about to quit Venice for Trieste immediately, and shall there make an excursion to Lippiza, and in the middle of next week, set off on a tour in Istria, from which I have great hopes of success, especially as to Monte Maggiore, between Pola and Fiume. Tommasini goes with me, and in other respects, I have every facility afforded me by the authorities. Prince Metternich, from whom, as well as from the Princess, we experienced much attention and kindness during our stay at Vienna, has given us letters for the provincial governors, and we trust that these will prove of some avail, in a country where the accommodations are so wretched as in Istria. On our return from Istria to Trieste, we mean to take Görz and Tolmeia, and thence to Villach in Carinthia, and Sienz in south Tyrol, coming to the Italian side by the Cadore road, and then by Belluno and Vicenza to Verona. I hope to ascend some of the interesting and little known Carinthian and Trient Alps."

"Eaux Bonnes, *August*, 1839.

"Before leaving this place, perhaps the best station for Botany among these interesting mountains, (the Pyrénées,) I am anxious to let you know that though pursuits of another kind were my chief object in coming here, I have yet not neglected my favourite occupation, but have had an eye to Botany during my whole route from England. From Dieppe, at which place we landed, to Bordeaux, we passed through an interesting, and for the most part a very pretty country, though not one of importance to the Botanist, unless he dili-

gently explores the sea-coast. It may, however, be worth remarking, that in this distance, of comparatively a few miles, we came to six, I believe indeed seven, towns where there were public Botanic gardens, kept up at the public expense. At Rouen, they have, within the last two years, taken a large piece of ground in the Fauxbourg St. Sever, planted the *école* or collection of plants, arranged botanically, and are preparing to build houses, &c. In the garden of Caen I was disappointed. I had been told it was one of the best, and found it the worst kept, the most erroneously named and poorest collection of all. I did not see that at Rennes: the garden at Nantes is chiefly remarkable for its fine avenue of *Magnolias;* and my time at Rochelle was so short that I did not even ascertain if there was an institution of the kind in the place. The Botanic garden of Rochefort adjoins a noble public walk, called the *jardin public*, and contains a very good collection in excellent order, and with some fine specimens. At Bordeaux, the Linnæan Society of which is well known, the garden is extensive and rich, especially in trees. The respective magnitude and value of these establishments depend of course on the size of the town to which they belong, and the manner in which the general plan is worked out; but they are invariably considered needful where medical education is carried on to any extent, and of material service in an agricultural and economical (to use the latter word in the French sense) point of view, independently of mere horticulture which is now much better appreciated in France than it used to be. These gardens are all more or less laid out on the same plan. Each has an *école*, containing the arranged collection, distributed into natural orders, and where is also placed, in summer, a specimen of each of the greenhouse plants they may possess; a medical collection, containing medicinal plants; often a collection of agricultural plants, and one of *plantes économiques*, that is of such vegetables as are useful for purposes not strictly medical, nor yet agricultural; sometimes also there is a separate *Arboretum*. In all of them lectures are given during spring and summer, either upon

pure Botany, or more frequently upon medical and rural (that is agricultural) Botany.

"If all these little towns are thus endowed at the public cost with advantages that we cannot obtain for the first city in Europe, they all have, in a greater or less degree, those defects which are inseparable from small establishments in country towns; but which would be most easily avoided, did we but possess a moderately endowed garden near London, that centre of science. The chief disadvantage that attaches to them is the want of a Superintendent sufficiently versed in Botany to check the nomenclature and correct the errors of the practical gardener. Tender plants die, hardier ones spring up in their place and are taken for them; and the consequence is, that, in some of the gardens, nearly half the names are wrong. There is also a great tendency to encourage and perpetuate accidental hybrids and garden varieties, which, however important they may sometimes prove to the Horticulturist, are always worse than useless in a Botanical Garden intended for instruction. Those institutions appear the most serviceable where the aim is to increase genera rather than species, and among the latter to cultivate chiefly those which have the least similarity to one another, or are the most interesting from their characters and properties.

"From Bordeaux to Pau the road crosses a small part of the Landes, but I had not time to herborize much. The *Pinaster*, which covers some of the wooded districts, is precisely the same as the one growing on so very different a soil on the Maritime Alps and hills of Southern Provence, and varies, as in our gardens, in the length of leaf, and depth of colour: but is readily distinguished from *P. Laricio* and other allied species, by the cone and facies. The *Tauzin Oak*, which is here abundant, is a very handsome tree, especially when growing with the *Quercus pedunculata*, the grey foliage of the former contrasting well with the bright green of the latter. This *Q. Toza* is generally pollarded; but some specimens, left to themselves, formed much larger trees than I had imagined, and the species seems altogether much preferable to the

Q. pubescens, the most common sessile-fruited Oak in the south of Europe. The *Cork tree* is also frequent in the Landes; but in the part I crossed, there were but a few and stunted individuals.

"It was on a cloudy day that we arrived at Pau, and the Pyrénées were hidden from view; but the next morning, going out on the promenade, their long line of rugged peaks, extending along the whole of the south, near and distinct, backed by a perfectly clear sky, produced in me sensations which I had not felt for a long time and during the whole day that I remained at Pau, I could scarcely take my eyes from the fascinating object. Perhaps it is owing to the association of my ideas with the happy tour I formerly made there, as well as from the peculiar nature of these mountains, springing so suddenly and majestically from the plains below, but the view of the Pyrénées, from every point on the French side, did always appear to me to excel any chain of the Alps, though the latter be on a very much larger scale; and it was with the greatest delight that on the 2d of August, we at last entered the Valley of Ossau, leading to this place. Yet the day was most scorching, the country, even to the mountain pastures, burnt up by the unusual drought, and it was in a cloud of dust that we toiled up the road as slowly as overtired post-horses could drag us, and this place, enclosed in a deep narrow gully opening into, or rather shut out from the eastern branch of the great valley, felt so close and sultry that nothing but its wild woody precipitous sides, crowned by rocky peaks and patches of snow, reminded us that we were close under mountains, rising to near 9000 feet above the sea.

"I had met at Pau with a M. Manescon, the master of the post and diligence, who is an amateur of Botany, and recommended me to the apothecary here, M. Cazeaux, who has some knowledge of the science, and through whom I made acquaintance with the intelligent self-taught, but really excellent naturalist of the Vale of Ossau, Pierre Sacazes Gaston, a peasant and shepherd, who though far from being poor, is

yet obliged to handle the scythe, the sickle, or the plough, and to tend his own flocks on the mountains. Attracted towards the study of Botany by the sight of some specimens gathered by a herbalist of Laruns, he procured a copy of Lapeyrouse's *Histoire Abrégée des Plantes des Pyrénées*, learned Latin enough to understand the botanical diagnoses, wrote out a portable synopsis of the work, rambled over the country whenever he could spare time, formed for himself a rich herbarium of the neighbouring heights, which he has named, and with few exceptions, named well too, learned to draw sufficiently for the purpose of making rude but recognisable coloured sketches of his plants, and with the further assistance of one or two books which he has contrived to obtain, aided by a little intercourse with M. Grenier of Besançon, and some other Botanists who have visited this place, he has acquired a thorough knowledge of the stations, geographical and geological of these mountains, and a far more critical and perfect acquaintance with the plants he has found than many a professor with a Botanical garden and library at his command.

" Aided by Gaston's directions, I have made three rich herborizing excursions from this place, independently of shorter excursions, first to the Col de Leyt and Mont Grume, secondly, to the Cols d' Arbas and de Torte, (all of them between 5000 and 6000 feet high), and the third to the Pic de Ger, nearly 9000 feet high. These mountains have been visited by Leon Dufour, who published the result of his excursions in the Annals of the Linnæan Society of Bordeaux, as also by Grenier, who gave a short account of his tour and of his intercourse with Gaston in the same work. Yet such is the richness of this Flora that several interesting plants have since been found. One is a fine *Thalictrum*, perfectly distinct from any species I know, lately published by Grenier from Gaston's specimens under the name of *T. macrocarpum;* another is a *Lithospermum*, growing in the chinks of the large calcareous rocks above the woody region, which Leon Dufour appears to have mistaken for *L. purpuro-cæruleum*, he having only seen it when very young. This plant is now in fruit, and is cer-

tainly quite distinct, so far as I can judge; it is suffrutescent, throwing up many herbaceous erect stems, simple and about nine inches or a foot high; the leaves dense, deep green, ovato-lanceolate and pointed; the flowers are sessile and axillary, and the corolla, which I have not myself seen, is, according to Gaston, blue, with all the characters of *L. purpuro-cœruleum;* the nuts very large and rugose, which latter peculiarity serves at once for a distinctive character. I should like to call it after this botanist, *Lithospermum Gastoni.*

"Another interesting species is an *Iberis*, evidently the same as Lapeyrouse took for *I. nana* of Allioni, and which I had supposed identical with *I. spathulata.* So far as I can judge, from the books and materials at my command, this plant is distinct from both the above-named species, and especially marked by its erect though very short stems, and much narrower and deeply toothed leaves: but I cannot venture to name and characterize it without farther comparison.

"Amongst a number of good Pyrenæan plants, overlooked by Dufour and Grenier, I may mention *Medicago suffruticosa*, which is common in elevated pastures, and my *Lepidium heterophyllum*, now found in several places. There is also a dwarf *Composita*, allied to *Serratula*, of which I saw a single specimen in Gaston's collection that I do not recognise, and every thing shows that there is still much to find in the centre of the Pyrenæan chain and on the Spanish side. Indeed, I have no doubt, that were a little time at my disposal in this neighbourhood, I might, even at this advanced season of the year, make new discoveries in the Flora of the Pyrénées."

"Bagnères de Bigorre, *Sept.* 5.

"We came hither on the first of this month, after having spent a fortnight at the Bagnères de Luchon, a place well known as forming a point from whence several of the richest botanical excursions in the central Pyrénées may be made with the greatest convenience. The alpine meadows of Esquierry and Medapoles, never fed off, but only mown late in the year, the extensive glaciers of Or and Crabioules, the

several passes ('ports' as they are here called) in the elevated rocky ridge separating the two kingdoms of France and Spain, together with many other equally interesting botanical stations, may severally be visited in a single day's excursion from the town of Luchon, and if the traveller is willing to sleep out for one or two nights, either the Spanish mountains around the Maladetta, or this latter gigantic mass of rock and glacier itself, or the lower mountains below the town of Benasque, may be searched with comparative facility. For my own part, I feel little doubt but that every such expedition undertaken somewhat earlier in the season, and prosecuted by a careful botanist, would, for some time continue to make additions to the Pyrenæan Flora, although the researches of Endress, Dufour and Grenier and others, have already much enriched it since the period when, accompanied by our mutual friend, Dr Arnott, I explored these mountains in the year 1825. Amongst those who have been herborizing with the greatest zeal, is, I am told, a Dr Bobani, an Italian Refugee, possessing much general information and who is very ardent in the pursuit both of natural science and literature. He has been at much pains to examine into the various controversies that have been raised on the vegetation of the Pyrénées, and has collected many valuable data, which would prove highly useful to persons interested in the Flora of Europe. This gentleman's attention is now chiefly directed to preparing for publication a Flora of Virgil.

" M. Paul Boileau, well known to all naturalists who visit Bagnères de Luchon, has made several interesting excursions; though his time is too much occupied during the watering season to allow him to pursue his researches at the best and most productive period of the year. He gathered this spring on the rocks of the valley of the Essera, below Benasque, a plant which he considers as the *Lychnis Pyrenaica ;* but on comparing it with my dried specimens from the valleys of Aspe and Ossau, I cannot but pronounce it to be a different species. It may prove only the *variety β.* indicated by Lapeyrouse, in his Supplement, page 62, for it possesses all the

peculiarities there adverted to; it is, indeed, almost shrubby at the base, and thickly covered with the old persistent leaves. In my specimens, the leaves, moreover, are not ciliated as they almost always are in the real *L. Pyrenaica*, and the calyx is of a different form, being more than half as long again and not broader. It grows on hot rocks, in the lower valleys of the Spanish side, whilst the *L. Pyrenaica*, at least wherever I have gathered it, is only to be seen at elevations of between 4500 and 6000 feet above the sea on the French side. If the name of *Lychnis fruticulosa* be not occupied, I should propose applying it to this species.

"The only excursion of any importance that I had leisure to make from Bagnères de Luchon was on the mountains behind the Maladetta. I crossed the Port de la Picade; slept at the town of Benasque, the next day ascended the ridge of the Ardonnex between the Pass of Castanèse, already celebrated for its botanical riches, and the Maladetta; descended by the wild gorge of Balivièrna at the foot of the Maladetta, slept the second night at the Spanish Hospice, and returned on the third morning over the Port de Benasque to Bagnères. The first and third days my way lay over the well-beaten track of former naturalists, and which I had myself visited before; but the second day was on comparatively new ground, and though I did not gather any thing absolutely new, I made a very successful quest, and seldom has a single herborization been rewarded with a greater variety of vegetation. Leaving Benasque in the morning the rocky pastures showed themselves clothed with sweet herbs, prickly *Leguminosæ*, and other plants indicative of a dry southern climate; most of these, it is true, were much scorched up with heat and drought, still, enough remained to prove the extent and variety that had prevailed, and a little higher up, great masses of *Astragalus aristatus*, and some large *Umbelliferæ*, were still in very good fruit. As I gradually ascended into the Alpine regions, I found the common Pyrenæan species in great beauty of flower and fructification, and met with many of the rarer ones, as *Viola Cenisii*, *Alyssum diffusum*, *Papaver aurantiacum*, *Gaya Pyrenaica*; a

species of *Phaca,* which may be *P. glabra,* or perhaps only *P. australis;* an *Oxytropis,* perhaps a mere variety of *O. Uralansis,* but looking very different; a number of good grasses; *Galium cometorrhizon,* (Lapeyrouse), or *G. Villarsii,* (Regnier), &c. I also collected with much pleasure a commoner Pyrenæan plant, *Iberis carnosa,* (Lapeyr.), or *I. spathulata,* (DC.); because it proved to me that the *Iberis* from the neighbourhood of Eaux Bonnes, which I mentioned to you in my last letter, is assuredly distinct.

"From these alpine summits I descended by smugglers' paths, the tracks often obliterated, through the wildest gorges, often appearing impracticable to human foot, but along which we led our mountain ponies, to the valley of Balivierna. Here I had intended to sleep; but having already filled my box and stock of paper, and being destitute of means for carrying safely any more plants, I was obliged to hurry down the precipices, snatching here and there at single specimens of the ever-varying vegetation we trod upon; for here, as in many of the southern declivities, the alpine and southern vegetation grows almost intermingled. The valley of Balivierna is also so wild and precipitous, that it is less fed down than most of the mountains around, and during the whole day the nature of the rock was perpetually changing from one to another of the great primary divisions, granite, schist, and limestone. This valley presents an admirable field where a botanist might advantageously encamp for a few days, and investigate the country around; and I am even persuaded, from the aspect of the Maladetta on this side, that, with proper precautions, the *Pic Nithon,* the loftiest point of the whole Pyrenean range, might be ascended without much difficulty, though all attempts to reach its summit from the north, have hitherto proved abortive.

"My guide, Jean Argaro, a person thoroughly acquainted with these Spanish mountains, and I, had been on our ponies, or on our legs, ever since four in the morning, and it was near six in the afternoon, before we issued from the gorge of Balivierna. The paths over which the poor animals

had travelled, were such that one would have supposed they could scarcely have had strength to stand; but no sooner did they find themselves in a country with which they were acquainted, than they galloped off with us wherever the road would possibly allow, and by nightfall we were lodged in the Spanish Hospice de Benasque. Here I slept soundly on the stone floor, in a hovel about sixty feet long, fifteen broad, and six or seven feet high in the middle, along with twenty-two Spaniards, smugglers, custom-house carabineers, charcoal and lime-burners, labourers, and shepherds, together with two women, three children, four horses, two mules, three asses, poultry, pigs, &c., &c. Fifteen of us men occupied the middle room, about fifteen feet square; we gathered round the fire, which, as usual, was made in the centre of the floor, and the smoke hovered about us like a thick cloud, down to three feet from the ground, before it escaped through the roof, which, with the stone walls and floor, were, of course, as black as any chimney. And thus do many of the Spaniards live the whole summer, scarcely taking off their clothes once a-month, and never having any thing more than a blanket cloak interposed between them and the stones on which they extend themselves at night. When a charcoal-burner came into this hovel from time to time during the night, and squatting before the fire, flung on it some branches of the *Pinus uncinata*, which is full of turpentine, the vivid light, reflected on the ragged sleepers around me, had an indescribably picturesque appearance, and almost made me forget the soreness of bones and watery eyes which were produced from the same cause.

" Some other shorter excursions about Bagnères de Luchon were very unproductive, chiefly on account of the late unusually severe drought. It has now at last rained; but I fear the change of weather has come too late to do any good either to Botanists or to the unfortunate inhabitants of these regions, who will gather but a miserable crop of maize, and whose cattle are perishing for want of vegetation and of water, on the mountains."

"Paris, *Nov.* 1839.

"Since I came here, I have been chiefly occupied in collecting materials and notes for my memoir on the *Leguminosæ*, at the Herbarium of the Jardin des Plantes, of which, during late years, the importance as well as accessibility have been much increased. The Herbarium is now lodged in a large and handsome building; the central part, a fine room, is appropriated to the mineralogical collection, one wing to the library, and the other to the botanical collection. The latter portion is divided into two floors; the ground floor contains the fruits, models, &c., and especially a very fine selection of woods, which have lately been procured at great pains and expense from various parts of the world, together with specimens that serve to identify them. The arrangement of this department is now proceeding under the special and active superintendence of M. Adrien Brongniart. On the first floor is the Herbarium; the principal room is devoted to the general herbarium, and is lighted from above: around it are eight or ten small apartments appropriated to special Floras. The present plan is to deposit all the unique specimens in the general herbarium, but to endeavour to obtain duplicate sorts also, by aid of which geographical collections, or herbaria of the most important botanical regions, may be formed. If well followed up, which can only be effected in a large public establishment, this scheme must prove highly serviceable to persons who are at work on the Floras of any particular country—a case which frequently occurs. There is besides a good working-room, well lighted and furnished with plenty of tables, the whole kept remarkably clean and neat, with even a degree of elegance exhibited in its polished floors, &c. Jussieu is at the head of the establishment, where, however, he is not often seen, as he works at home, and his business lies chiefly in the office of the Administration. Gaudichaud, Guillemin, and Decaisne, have the more immediate management of the establishment, and a young man is employed as an assistant for the mechanical operations. Amongst the botanists who often come there, is Boivin, who

for years has been hard at work especially on Mediterranean plants, and Bové, who is arranging those which he found in the north of Africa. Baron de Lessert continues his liberal patronage of every botanical undertaking, and has much increased his herbarium, which is arranged according to Sprengel. His 4th volume of *Icones* is just finished.

"Guillemin returned in August from Brazil, with a cargo of Tea plants, and a considerable quantity of other growing specimens, destined to enrich the Jardin des Plantes. I believe he has given great satisfaction to the Government who employed him, the object being to cultivate Tea in Algeria. M. Guillemin also brought a good dried herbarium from the province of St Paul; and purchased in Brazil, for De Lessert and the museums, a valuable and extensive collection made by Claussen near the Rio San Francisco, in Minas Geraes."

Farther recent Botanical Information from Paris has been communicated by another valued correspondent, from which the following is extracted:—

"M. Decaisne, who is indefatigable, is describing the plants brought from Arabia by Bolter, son of the historian, who went as Naturaliste Voyageur from the museum, and desires to return there. They have just sent a young gardener, (Pervillé) who worked in Mr Webb's herbarium, and was very intelligent, to Madagascar; and another, Mellineau, who was at Chatsworth, is going to Cayenne. Leprieur, who is returned from thence, is about to publish the *Filices* he has collected, and Montagne the *Cellular Plants*—the excellent Baron Delessert, defraying the expenses. Montagne is, as ever, most laborious, being, besides, engaged on the *Cryptogamia* (from Cuba) of La Sagra, and those of D'Orbigny's extensive and interesting journeys in South America. M. Gay is writing a paper on *Matricaria*, *Anthemis*, and the neighbouring Genera. Moquin has just sent his *Enumeratio Chenopodearum* to the press, the printing of

which Mr Webb has generously undertaken to superintend. It will form a thin octavo."

Dr Welwitsch,* who a little time ago left England for the Azores, &c., has been unexpectedly detained in Lisbon. With respect to this botanical traveller, we have received some interesting particulars from Mr William Pamplin, who we believe is the agent for the disposal of his collections in this country, and who has been in close correspondence with him. Dr Welwitsch says in his first letter, dated Lisbon, September 7, 1839, "Safely arrived in this place, on the paradisiacal banks of the Tagus, I soon learned from the most correct sources of information, that especially at this season, the opportunities for performing the voyage to the Azores, particularly to Fayal, or Pico, are by no means so frequent as our people in the north are inclined to believe. I therefore shall as quickly as possible, make the necessary preparations for the satisfactory employment of the time I may have to spend in Portugal; and indeed I began from the first day of my arrival to make a number of botanical excursions, which during the space of six weeks, have afforded me so many treasures, that I am already able to send a tolerable collection of several thousand Portuguese plants, insects, and shells, to the Wurtemberg Natural History Society, (the *Unio Itineraria*). At the same time, I have gained such a proficiency in the Portuguese language, as to be able to make myself easily understood by the inhabitants; which is the more important to a traveller going to the Azores and Cape de Verdes, as nothing so much wins the favour of the proud and unsociable Portuguese, as an acquaintance with their language. Towards the end of this month, I hope certainly to embark." And on the 21st of October, (Lisbon,) he says, "According to my former letter, you may imagine me already arrived in that groupe of islands, which, strange enough, is not reckoned to belong to any one quarter of the globe, the Azores. But the weather

* See the Botanical Information given at page 32 of this volume.

is so bad, and the equinoctial gales so powerful, that even the steamers have not been able to make the voyage regularly to Oporto. It may therefore easily be supposed, that a light-sailing vessel would not venture among the Archipelago, surrounded by rocks, where these storms rage with the greatest violence. Therefore, I remain here yet a fortnight or eighteen days longer, and happily the moist equinoctial weather has induced a great number of bulbs to shoot forth in the valley of Estremadura, which will furnish my collection with many interesting rarities. Of *Colchicum alpinum*, *Ornithogalum Lusitanicum*, *Leucojum autumnale*, &c., I have, within the last few days, gathered most beautiful specimens; as also of that elegant Fern, *Davallia Canariensis.* In particular, my store is enriched with a greater number of cryptogamic plants than I could possibly have anticipated; amongst them are the *Staurophora pulchella*, Willd., (*Lunularia vulgaris*, Micheli, *Marchantia cruciata*, L.) of which I have gathered numerous fertile specimens in the Alpine valleys of the Serra de Cintra, and the many heavy rains bring daily several kinds of *Hepaticæ* to a state of perfection. The same cause has called forth a renewal of spring in the woods and Alpine pastures; and the golden stars of the *Ranunculus bullatus* clothe the lately barren and parched Kneiden hill with a brilliant carpet. The heaths and laurel-bushes are in full flower, and many plants that had been long withered, revive and blossom afresh." And on the 3d November, he writes, "I have up to this time collected from 7000 to 7500 specimens, which in the next week will amount to 8000, since an important excursion will be undertaken to Serra da Arrabida, to which I receive military escort, without which the provinces along the sea-shore cannot be safely visited. In the environs of Lisbon all is green. The olive-trees are loaded with ripe fruit, the laurel and the ivy are in full bloom, and the beautiful strawberry-tree is at the same time covered with flower and fruit. The thermometer is generally from 13°—17° R.; but the torrents are now frequent and violent, and last from four to five days, yet then again the heavens smile

in the deepest and brightest blue, and all things breathe a May air. I am now very busy in putting my collection in order for packing, marking the localities and fastening on paper many of the marine *Algæ*. The Tagus is much richer in *Algæ* than I should have supposed from the representations of preceding travellers." The last communication to Mr Pamplin was dated Lisbon, January 11th, 1840. "In a short time I shall send through you, my collections already made in Portugal, amounting to at least 11,000 specimens, and more than 100 bulbs, which you will kindly forward, by the most expeditious conveyance, to the Directors of the Unio Itineraria. The collection of cryptogamic plants, I consider peculiarly rich, amounting to from 130 to 150 species, and 20 to 30 specimens of each. They are all in the best and most perfect state; and among the *Lichenes* are some which I believe will prove new species or well-marked varieties. I have but just returned from a week's excursion in the Serra de Cintra with a good booty. All the declivities of the Serra are spangled with the golden blossoms of *Narcissus Bulbocodium*. Among the bushes and various shrubby plants appear the blue flowers of the *Lithospermum fruticosum*; and by the margins of the now swollen mountain rills, *Narcissus stellatus*, *DC*., and a species of *Asphodelus* abound; while in the higher regions of the Serra, numerous species of *Ferns* and *Lichens* are to be seen among the mossy stems and rocky precipices. The temperature at the coldest part of the day, is generally = + 5—8° R., and at noon = + 12—15° R."

It is understood that Aucher Eloy's plants are on their way from Constantinople to Paris; but it is not yet known whether they are the result of his unfortunate Persian journey, or the remainder of the collection he left behind him. M. Boivin has still on sale the collections of Verraux's Cape of Good Hope plants. They are good specimens, named, and offered on the very reasonable terms of 33 francs the 100.

Boué's second series of the plants of Algiers are in the course of distribution, (we have received our own set, amounting

to 900 species.) There are many new and interesting disputed species, collected at Constantine, Blidah, and some of the best at Oran, and though not all of them named, they will be cited by the "Botanicorum nostræ ætatis celeberrimo," at Geneva. M. Bory de St Vincent has taken the command of the scientific expedition in Africa: Durieu and Boué are to be his fellow-labourers; the former well known by his beautiful collection of Spanish plants, and the latter by those already sent from the north of Africa. It is not perhaps generally known that this zealous botanist, M. Boué, is a Belgian by birth, and was a gardener at the Jardin du Roi, and afterwards gardener to Ibrahim Pasha at Cairo. By his intimate acquaintance with the eastern Arabic, he is able to pass himself off as an Egyptian Mameløeck in the French service, amongst the Moghrabins of Algiers, whose language is very corrupt; and thus in his last expedition, he was well received everywhere as a Mahometan.

South African Plants.

While engaged in writing this for the press, we have the pleasure of receiving information from our inestimable friend, Mr Harvey, at this time on a visit in Dublin, of the arrival of six sets of *select* South African plants, collected chiefly in the district of Uitenhage, by the indefatigable Mr Zeyher, each containing three hundred species. Having ourselves last year received a very fine collection from this botanist, and wishing to unite with Mr Harvey in giving all possible encouragement to so truly deserving a man, we requested Mr Zeyher to send six sets, feeling assured that there would be a certain demand for at least that number; they are ordered to be placed in the hands of Mr Pamplin, and are offered by Mr Zeyher at the very moderate rate of thirty shillings the hundred; to which will have to be added some trifling expenses for share of freight, &c. It is but fair, however, to state, that three of these six sets are already bespoken; but the public will now have the opportunity of knowing the merits of Mr Zeyher as a careful and zealous collector, of inducing

him to send farther supplies from his late journeys, and of aiding him in those which he is now about to undertake. The following is an extract from the letter, which accompanied the box of plants, and addressed to the Hon. W. H. Harvey :—

CAPE TOWN, *Nov.* 1, 1839.

"DEAR SIR,—With the greatest pleasure I have heard of your happy arrival at home, and your intention to revisit this colony in about ten months, and I wish you a safe return to this place again. I have received your letter, written at the time you left the colony, by the favour of Baron Ludwig, and feel obliged for your kind intentions towards me, and the favour you confer upon me in honouring me with further orders respecting botany. My stay in Cape Town has been longer than I expected, but I have occupied that time in arranging my plants, and bringing those collections into a disposable state which I have been engaged in making for the last two years in the remote eastern districts of the colony. I have also taken the liberty to prepare six selections of the more rare plants for Sir W. J. Hooker, in Glasgow, for which you were so kind as to obtain orders for me; and I hope these will meet with Sir William's approbation. As I am ready to start by the first opportunity by sea to Algoa Bay, and to proceed immediately after for the *northern* districts, I have been very anxious to finish this first transport, and to fulfil Sir William Hooker's commission. I have now besides arranged twenty herbaria for sale from my entire collection; and shall feel greatly obliged if you would recommend them to the friends of botany generally, in your country, so that I may thus be furnished with the means of covering the expenses of my now still more distant travels. And I also beg of you farther to have the kindness to bring me to the notice of Horticulturists, and assure them that I am willing to procure bulbs and seeds from South Africa, which I shall select with care; and I trust, by diligence and attention, to ensure the satisfaction of those who may favour me with their commands. My journey to the north will occupy

a year or more, and then I shall return for a short period to Europe."

This important journey will take our traveller through Port Natal, whence Mr Harvey has received a most valuable collection of plants, made by Lieutenant-Colonel Peddie, who commanded the 72d Regiment. Some of them are now before us, and they present several entirely new genera, and others little, or not at all, known as inhabitants of southern Africa.

The following is a list of the plants contained in each of the six collections from Uitenhage, which have just been transmitted to Mr Pamplin :—

643 Scirpus
1038 ——— truncatus
185 Andropogon
462 ———
447 Stipa
502 ———
167 Ehrharta
253 ———
662 Rottboellia
657 Triticum
621 Avena
469 ———
453 ———
770 ——— elephantina
328 Scabiosa anthemifolia
698 Cephalaria attenuata
29 Oldenlandia Caffra
949 Boscia undulata
299 Laurophyllus Capensis
468 Psamotropha parvifolia
995 Pyrgosea turrita
1042 ——— tetragona, n. sp.
1041 ———
425 Portulacaria Afra
987 Cotyledon ramosissima
990 Crassula tetragona
991 ———
985 ——— filicaulis
996 ——— acutifolia
989 ——— perforata
1043 Crassula
988 ——— cordata
994 Sphæritis typica
993 Globulea canescens
982 ——— cultrata
1040 ———
986 ——— radicans
1045 Tetraphyle campestris
136 Petrogeton nemorosum
729 Helophytum inane
641 ——— fluitans
653 ——— β. intermedium
588 Dregea virgata
721 Peucedanum rigidum
584 Anesorhiza macrocarpa
422 Cynorhiza montana
414 Cnidium suffruticosum
535 Trinia Uitenhagensis
580 Lichtensteinia Sprengeliana
467 Ipomœa
561 ———
261 Echites bispinosa
262 ——— succulenta
671 Sarcostemma aphyllum
670 ——— viminale
36 Ceropegia stapeliæformis
591 Lagarinthus
538 Astephanus linearis
603 ——— lanceolatus
6 Hamiltonia Capensis

560 Cussonia thyrsiflora
625 Trichocladus crinitus
673 Icacina
1053 Aloe
1052 ——
1059 Anthericum
1058 ————
1057 ————
1069 ————
1070 ————
1067 ————
1068 Bulbine
107 Loranthus elegans
607 Asparagus
1061 ————
1077 Limeum fluviatile
267 Gnidia pungens
210 Dais linifolia
732 —— argentea
498 Amyris inæqualis
776 Dodonæa Caffra
30 Erica
341 ——
197 ——
227 Polygonum
618 Silene primulæiflora
114 Polygonum
425 Zygophyllum insuave
219 Schepperia juncea
777 Virgilia sylvatica
132 Oxalis breviscapa
91 —— macrophylla
98 —— candida
96 —— stellata
131 —— ciliariflora
93 —— imbricata
92 ——
1075 ——
672 Schotia latifolia
536 Chamæcrista Capensis
681 Eugenia Zeyheri
8 ——— Capensis
858 Eriudaphus Zeyheri
412 Aizoon argenteum
188 ——— pubescens
259 ——— hirsutum

1049 Kolleria
1096 Mesembryanthemum
1095 ————————
1094 ————————
1093 ————————
1092 ————————
1091 ————————
1090 ————————
1089 ————————
1088 ————————
1087 ————————
1086 ————————
1085 ————————
1084 ————————
1083 ————————
1082 ————————
1081 ————————
1080 ————————
1079 ————————
1078 ————————
1077 ————————
1100 Euphorbia uncinata
1098 ———— Commelini
1101 ————
1099 ————
1097 ————
457 Nymphæa scutifolia
569 Capparis Volkameriæ
179 ——— citrifolia
237 Niebuhria Caffra
1 Grewia flava
487 ——— obtusifolia
89 Lyperia microphylla
846 ——— pinnatifida
842 Chascanum cuneifolium
692 Chænostoma
1032 ————— pumilum
746 Stachys subsessilis
121 Plectranthus Thunbergii
588 Selago
769 ———
115 Nuxia floribunda
375 Gerardia scabra
31 ——— tubulosa
638 Orobanche
233 Aletra Capensis

475 Blepharis saturejæfolia
146 Blepharanthus Capensis
242 ——— procumbens
334 Chætacanthus Persoonii
78 Rhytiglossa ciliata
40 Peritrophe cernua
260 Gendarussa cuneata
82 ——— Capensis
241 Heliophila falcata
1103 Hibiscus Ludwigii
392 Hermannia velutina
157 ——— conglomerata
460 Acacia Caffra
655 Chorisma tetragona
337 Polygala pungens
611 ——— Sprengeliana
391 ——— attenuata
1105 ———
745 Muraltia ruscifolia
372 ——— macroceros
123 Psoralea hirta
668 ——— diffusa
393 ——— Algoænsis
305 ——— affinis
401 Polylobium intermedium
1108 Argyrolobium
323 ——— sericeum
88 ———
705 ———
868 Lotononis acuminata
465 ———
330 Desmodium squarrosum
191 Tephrosia grandiflora
228 Dolichos angustifolius
333 Phaseolus Capensis
533 Dichilus ciliatus
109 Podalyria patens
80 Indigofera denudata
213 ——— stenophylla
1109 ———
257 Aspalathus horrida
377 ———
38 ——— marginalis
415 ——— spinosa, β. longifolia
755 ——— adelpha
245 ——— suffruticosa
310 Aspalathus
1111 ———
203 ——— chortophila
264 ——— albiflora
714 ——— poliotes
42 ——— nivea
378 ———
1011 Sphœnogyne fœniculacea
69 Xerothamnus Ecklonianus
67 Psilothamnus adpressifolius
9 Gerbera piloselloides
753 Berkheya
406 Chrysocoma
1113 ———
500 Conyza incisa, β. hirta
550 Baccharis cuneata
481 Tarchonanthus racemosus
309 Brachylaena
650 Morysia pinnata
315 ——— dentata
297 Gamolepis euriopoides
72 Euriops Algoænsis
65 ——— tenuissimus
397 Eclopes trinervis
256 Pteronia xantholepis
404 ——— flexicaulis
407 ——— membranacea
726 Gamolepis mutica
765 Doria carnosa
119 Othonna carnosa
116 ——— membranifolia
614 Felicia ficoidea
3 ——— rigidula
623 Brachyrhynchus reclinatus
73 ——— junceus
519 Senecio crassulæfolius
111 ——— angulatus
120 ——— gonocladus
953 ——— deltoideus
709 ——— œderiæfolius
957 ——— paucifolius
763 ——— crassiusculus
597 Nidorella longifolia
129 Dimorphotheca Ecklonii
949 Cacalia articulata
416 Helichrysum recurvatum

751 Helichrysum fulgidum
282 ——— lupulinum
713 ——— Burchellii
339 ——— felinum
317 ——— teretifolium
158 ——— striatum
381 ——— cymosum
53 ——— anomalum
479 ——— concolorum
702 ——— ferrugineum
373 ——— xeranthemoides
535 Leontonyx tinctus
45 Amphiglossa callunoides
628 Disa graminifolia
79 Metalasia aristata
1029 Scopularia Burchellii
1117 Angræcum arcuatum
1118 ———
1119 ———
609 Lissochilos
1121 Ceratiosicyos Ecklonii
543 Cephalandra quinqueloba
20 Phyllanthus Capensis
735 Croton Capense
727 Euclea pubescens
1125 ———
767 ———
7 Prockia rotundifolia
507 Loxostylis alata
149 Hippobromus alatus
559 Ekebergia Capensis
160 Pteroxylon utile
166 Pappea Capensis
679 Menispermum Capense
724 Trimeria trinervis
680 Cavanilla scandens ?
280 Coniandra Zeyheri
564 Pilogyne suavis
596 Anthospermum ferrugineum
100 Equisetum elongatum
642 Chara
706 Schizæa pectinata
708 Gleichenia polypodioides
1126 Ceterach Capensis
599 Lomaria auriculata
527 Asplenium furcatum
691 ———
601 Cænopteris rutæfolia
677 Pteris serraria
528 ——— flabellata
1127 Cheilanthes hirta, β.
530 Adianthum Æthiopicum
511 Aspidium Ecklonii
525 ——— coriaceum
526 ———

VI.—*Contributions towards a Flora of South America.—Enumeration of Plants collected by* Mr Schomburgk *in British Guiana.*—By George Bentham, Esq., F.L.S., &c., &c.

[*Continued from page* 103 *of this Vol.*]

Tribe Mimoseæ.

246. Pentaclethra *filamentosa*, Gen. Nov.—British Guiana. Schomburgk, n. 408.

Pentaclethra. *Char. Gen.* Calyx campanulatus, brevissime 5-dentatus. Petala 5, basi coalita. Stamina 10, quorum 5 fertilia petalis alterna, 5 sterilia filiformia petalis opposita. Antheræ fertilium biloculares, loculis longitudi-

naliter dehiscentibus, connectivo apice glandulifero. Ovarium sessile villosum. Stylus filiformis, apice subincrassatus, truncatus, stigmate terminali. Legumen . . . . .—Arbores, foliis bipinnatis multijugis eglandulosis, spicis elongatis crassis paucis ad apices ramorum paniculatis, floribus numerosissimis sessilibus.—*P. filamentosa;* staminibus sterilibus corolla multoties longioribus.—Arbor elatus. Ramuli crassi glabri. Folia fere pedalia rigida. Petiolus primarius crassiusculus supra canaliculatus. Pinnæ circa 15-jugæ, petiolis circa 3-pollicaribus. Foliola 30—50-juga, linearia, falcata, acuta, basi valde obliqua, latere inferiore auriculata, 3—4 lin. longa, rigida glabra, supra nitida. Racemi 4—6-pollicares fere *Dimorphandræ macrostachyæ.* Flores fere $1\frac{1}{2}$ lin. longi, crassiusculi, glabri. Stamina fertilia corolla parum longiora, sterilia fere pollicaria, filiformia, albida.—This plant chiefly differs from *Dimorphandra* in the valvate æstivation of the corolla, which places it amongst *Mimoseæ.* Its fruit, at present unknown, may also probably furnish additional distinctive characters. The foliage is that of many *Mimoseæ.*

I have a second species from Borba, in Brazil, communicated to me by the Imperial Academy of St Petersburgh. The specimens are in flower only, the foliage and inflorescence are precisely the same as in *P. filamentosa;* but the flowers are rather larger and it may be readily distinguished by the following character:—*P. brevifila;* staminibus basi breviter monadelphis, sterilibus corolla brevioribus.

In the present state of our acquaintance with the extensive tribe of *Mimoseæ,* (of which I possess above 700 species, probably not half of what already exist in herbaria,) it is difficult to divide them into natural subtribes, but they may be provisionally arranged in three groups; 1. *Desmantheæ,* in which the number of stamens is definite, (usually 10,) and either half the stamens in every flower, or all the stamens in some flowers are sterile, filiform, or petaloid; 2. *Eumimoseæ,* with definite stamens, (usually 10), all fertile; 3. *Acacieæ,* with indefinite (usually very numerous) stamens. *Pentaclethra* from its affinity to *Dimorphandra,* might be placed at the

head of the first of these groups, which contains also the three genera *Dichrostachys*, *Neptunia*, and *Desmanthus*, united into one by De Candolle, but which appear to me as distinct from each other as most other genera of *Mimoseæ*. *Dichrostachys* is, so far as hitherto known, confined to Africa and Asia. Of *Neptunia*, the following occurs in the collections before me.

247. Neptunia *polyphylla*, *DC. Prod.* II. 444. *sub Desmantho ?*—Herbacea, glaberrima, sub aqua crescens, caule adscendente subcompresso. Stipulæ ovatæ vel lanceolatæ, acuminatæ. Petioli angulati seta terminati. Pinnæ 3—5-jugæ, glandula ovata depressa inter 1—2-inferiores. Foliola sæpius circa 30-juga, oblongo-linearia, obtusiuscula, 3 lin. longa, basi valde inæquilatera. Pedunculi axillares 3—4-pollicares glabri. Bracteæ 1 v. 2 alternæ lanceolatæ acuminatæ deciduæ, minores quam in *N. plena*. Capitulum ovoideum. Flores partis inferioris steriles calyce campanulato quinquedentato. Petala 5 oblonga stipitata. Filamenta 10, basi tenuia, extra corollam dilatata linearia membranacea flava, $\frac{3}{4}$ poll. longa acuta. Flores fertiles in parte superiore capituli: Calyx ut in sterilibus. Petala 5, oblongo-linearia basi non angustata subconnata. Stamina 10. Antheræ breviter ovatæ connectivo apice glandulam stipitatam deciduam ferente, loculis ipsis secus rimas demum verrucoso-glandulosis. Ovarium oblongum breviter stipitatum, glabrum; stigma magnum cupulatum. Legumen non vidi.—In savannahs, British Guiana. Schomburgk, n. 751.

The old *Mimosa plena*, or *Neptunia plena*, which I possess from St Vincent's, is allied to the above; but has fewer leaflets, the stem more compressed and pubescent, and the bracts much broader. I have besides two East Indian species, one Australian, one Peruvian (Cuming, n. 1027), one Brazilian, (Blanchet, n. 2700), and two Texian species, (Drummond, 3d Coll. n. 150 and 158.)

The true *Desmanthi*, or De Candolle's section *Desmanthea*, with the sterile flowers of *Neptunia*, has the habit and other characters of *Darlingtonia*. I possess five or six species, including Gardner's n. 981, from Pernambuco, Cuming's 918,

from Peru, and n. 151, 152, of Drummond's 3d Texas collection.

Darlingtonia, from its affinity to *Desmanthus*, may be placed at the head of the *Eumimoseæ*. I know but of the two published species, which are very much alike, and very inconstant in the number of glands on the general petiole.

248. Schranckia *leptocarpa*, *DC. Mém. Leg. p.* 441.—On the Rio Negro. Schomburgk, n. 931.—Also in Salzmann's and in Pohl's Brazilian collections.

249. S.? *brachycarpa* (sp. n.); caule pentagono piloso petiolisque aculeatissimis, pinnis 5—9-jugis, foliolis multijugis, pedunculo brevissimo, leguminibus lineari-falcatis aculeatissimis.—Stem and habit of a *Schranckia*; differs from *S. uncinata* in the number of pinnæ, and especially in the pods which are very numerous, and scarcely more than half an inch long, though very nearly ripe.—On the Rio Negro? Schomburgk, n. 903.

Nos. 95 of Drummond's New Orleans plants, 71 (bis) of his second Texas collection, 159 (bis) 159 (ter) of the third Texian set, are true *Schranckiæ*, and probably also 157 and 159 of the third Texian set, of neither of which I have seen the fruit.

250. Mimosa *floribunda*, *Willd.—DC. Prod.* II. 426.—Woods skirting savannahs on the Rio Branco. Schomburgk, n. 848.

251. M. *polydactyla*, *Humb. et Kunth*, *DC. Prodr.* II. *p.* 427.—British Guiana. Parker.—French Guiana, Leprieur, Herb. Par. n. 26.

252. M. (*Eumimosa bipinnata*) *camporum* (sp. n.); humilis, ramis pubescenti-hirtis aculeis minutis sparsis setaceis rectis, foliis bipinnatis, pinnis 2—5-jugis, foliolis multijugis linearibus mucronatis ciliatis apice subserrulatis, petiolo eglanduloso inermi vel hinc inde aculea minuta armato, capitulis globosis brevissime pedunculatis, leguminibus oblongis 2—3-articulatis setoso-hispidis.—Affinis *M. humili*. Foliola vix 2 lin. longa. Legumen fere semipollicare.—British Guiana. Schomburgk, n. 725.

253. M. *microcephala*, *Humb. et Kunth.—DC. Prod.* II. *p.* 428.—On the Parime mountains. Schomburgk.

254. M. (*Eumimosa? bipinnata*) *paniculata* (sp. n.); ramulis petiolisque pubescentibus retrorsum aculeatis, foliis bipinnatis, glandulis conicis ad basin petioli inter pinnas supremas et inter foliola suprema, pinnis 5—7-jugis, foliolis 7—11-jugis oblique falcato-rhombeis valde inæquilateris mucronulatis basi binerviis supra lucidis minute hirtellis subtus pubescentibus, racemis terminalibus paniculatis, capitulis globosis, leguminibus . . . . . .—Caulis scandens videtur. Foliola 4—5 lin. longa, 3 lin. lata. Stipulæ subulatæ deciduæ. Stipellæ setaceæ ad basin pinnarum. Capitula numerosa fasciculata breviter et inæqualiter pedunculata, 2 lin. diametro. Bracteæ subulatæ. Bracteolæ setaceæ parvæ. Flores tetrameri 8-andri. Legumen non vidi.—British Guiana. Schomburgk.

The above *Mimosæ* all belong to De Candolle's section *Eumimosa*, of which I have before me near a hundred species, forming two or three groups very distinct from each other as to the greater number of species, but which have intermediate forms which prevent my subdividing them without a more careful investigation than I am able at present to make. Some of them also run very much into the section *Habbasia*, the form of the pod and the number and arrangement of the spines being very variable.

The two following belong to De Candolle's *Bataucaulon*, of which I have about twenty species including *Acacia acanthocarpa*, Willd., and some others hitherto considered as *Acaciæ*, but of which the ripe pod certainly breaks into distinct articulations leaving the sutures persistent. In this section (also characterized by the pod), there are certainly many very different forms, which it will hereafter be found necessary to class in distinct groups.

255. M. *micracantha* (sp. n.); ramis subteretibus glabriusculis, aculeis in striis longitudinalibus minutis uncinatis, foliis bipinnatis, petiolo inermi v. hinc inde minute aculeato basi et inter pinnas et foliola extrema glandulifero, pinnis 2—3-jugis, foliolis bijugis late ovato-rhombeis obtusissimis valde inæquilateris subtrinerviis glabris v. subtus ad venas

pubescentibus, capitulis globosis paniculatis, leguminibus glabris lævibus latis inter semina subcontractis.—Affinis ex descr. *M. trinervi.* Foliola majora 2-poll. longa, minora vix semipoll., nonnulla fere orbicularia. Glandulæ petiolorum valde prominulæ. Capitula parva. Calyx 5-dentatus subglandulosus. Corolla 5-petala. Stamina 10. Antheræ eglandulosæ. Ovarium glaber. Stylus lateralis. Stigma obtusum. Legumen junius minutissime et dense pubescens in sicco ferrugineum, adultum glabrum læve 2-poll. longum plusquam semipollicem latum, planum, tenue, articulis minus longis quam latis.—Barcellos on the Rio Negro. Schomburgk.

256. M.? *acacioides* (sp. n.); inermis, ramulis verrucoso-glandulosis petiolisque minute tomentellis glabratisve, foliis bipinnatis, glandula oblonga in medio petiolo et 1—2 infra juga suprema, pinnis 20—30-jugis, foliolis multijugis linearibus obliquis acutiusculis apice dorso et margine subciliatis, pedicellis fasciculatis axillaribus v. ad apices ramorum paniculatis elongatis pubescentibus supra medium bracteatis monocephalis, legumine coriaceo glabro inermi glanduloso-verrucoso inter articulos contracto.—Arbor 20—30-pedalis. Glandulæ verrucæformes ferrugineæ numerosæ in ramis et legumine. Folia semipedalia v. paullo majora, foliolis numerosissimis parvis. Pedicelli 2—3-pollicares tenues. Bracteæ 2 oppositæ in unam coalitæ parvæ membranaceæ fuscæ. Capitula globosa 3—4-lin. diametro. Flores pentameri. Calyx puberulus. Corolla subglabra. Stamina 10, longiuscule exserta, basi breviter perigyna. Legumen unicum tantum vidi vix maturum 3-pollicare planum coriaceo-lignosum, valvulis sese arcte adnatis, in articulo facile secedens sed nescio an suturæ persistunt.—Woods, skirting savannahs in British Guiana, and also on the Rio Branco, where it is called *Black Parica* and *Paricarama.* The bark is used for tanning, and also medicinally to cure internal bleeding. Some tribes intoxicate themselves with the fumes of the seeds whilst burning.—Schomburgk, n. 852, (fruit specimen,) and 866, (flowering specimen).

257. M. (*Stachyomima*) *Schomburgkii* (sp. n.); arborea, inermis, foliis bipinnatis, petiolis leproso-tomentosis eglandulosis, pinnis 7—15-jugis, foliolis 15—20-jugis oblique oblongis obtusis glabris, spicis cylindricis elongatis multifloris fasciculatis sed panicula terminali dispositis, leguminibus coriaceis inermibus minute tomentosis.—Arbor 30—40-pedalis. Ramuli subteretes juniores leproso-tomentosi. Stipulæ subulatæ. Folia semipedalia. Foliola 2—3 lin. longa, 1 lin. lata; par infimum cujus pinnæ breviter stipellatum. Spicæ plerumque 3—4-natæ 3-pollicares. Rachis leproso-tomentosa. Flores pentameri. Calyx siccitate canus. Corolla crassiuscula minute tomentella siccitate canescens, viva alba. Stamina 10, glabra, corolla subtriplo longiora. Antheræ subglobosæ parvæ eglandulosæ. Ovarium sessile villosum. Stylus subulatus glaber. Legumen 2—3 poll. longum, 3—4 lin. latum, articulis 3—6, suturis persistentibus.—Pirara, British Guiana. Schomburgk, n. 715.

The section *Stachyomima* has the fruit of *Bataucaulon*, with a spicate inflorescence. No species belonging to it is mentioned in the Prodromus, unless it be amongst the decandrous plants referred to *Acacia*. Ernest Meyer has, however, since described one among Drège's Cape plants, and I possess about fifteen Brazilian species, including Blanchet's Nos. 2850, 2869, 2870, and 2912; and Gardner's 889, 1588, 2135, 2136, and 2137.

258. Entada *polyphylla* (sp. n.); pinnis 4—8-jugis, foliolis 12—20-jugis lineari-oblongis obtusis retusisve, subtus pilis minutis adpressis pubescentibus, spicis subgeminis in racemis terminalibus, rachi petiolisque puberulis.—Allied to *E. polystachya*, *DC.*, and probably also to *E. chiliantha*, *DC.*, but differs from both in the number of pinnules and leaflets, which latter are scarcely six lines long.—On the Rio Quitaro, Schomburgk, n. 604. Borba in Brazil, Herb. of the Petersburgh Academy.

259. E.? *myriadenia* (sp. n.); scandens, angulis ramorum petiolis rachique retrorsum aculeatis, foliorum pinnis 8—12-jugis, foliolis 20—40-jugis oblique oblongis mucronatis subtus

dense et minute glandulosis, glandula scutelliformi maxima ad basin petioli, et nonnullis inter pinnas superiores v. in petiolis partialibus, spicis fasciculatis paniculatis, floribus pentandris.—Frutex, super arbores altissimas scandens. Ramuli pubescentes, anguli 4-5 elevatis, spinis crebris retrorsis brevibus onustis. Foliola 2 lin. longa glabriuscula; glandulæ paginæ inferioris in sicco fuscæ. Spicæ 2—3-pollicares uti calyces fuscæ. Petala libera glabra. Stamina corolla parum longiora, sterilia nulla. Antheræ oblongæ glandula minuta fugacissima. Ovarium villosum. Stylus glaber.—Not having seen the fruit, I have some doubts as to this plant being a true *Entada*, as it differs from the other species in the number of stamens.—Rio Negro, Schomburgk, n. 917.

The great elevation to which the climbers which form this genus attain, and the enormous size of their pods, are probably the cause that even the more common species are seldom to be met with in herbaria, and scarcely ever in perfect specimens. Little therefore can be added to the extent or to the characters of the genus as given by De Candolle. It is very closely allied to the section *Bataucaulon*, and especially to *Stachyomima* amongst *Mimosæ*.

Gardner's n. 1589 from Ceará, belongs to a new genus which I have called *Plathymenia*. It has the calyx and corolla of *Entada*, 10 stamens usually twisted round the ovary in the bud, the filaments smooth and free, the anthers glanduliferous, the ovary and style very woolly. The pod is remarkable; in its outward appearance it is like that of the broad thin-podded *Acacias;* the pericarp opens in two valves as in *Acacia;* but the endocarp, as in *Entada*, separates from the pericarp, is thin, membranous, and indehiscent, but splits transversely between the seeds, so as to enclose each seed in a broad, thin, white, membranous case. Of this genus I have six Brazilian species. They are all apparently trees or shrubs, without prickles; the leaves bipinnate without glands; the leaflets ovate or oblong, blunt and oblique, usually numerous: the spikes of flowers long, axillary, supra-axillary, or collected at the ends of the branches, and the pod smooth.

Gardner's n. 361 from the Organ Mountains, Martius's *Acacia fruticosa*, and two other species in my herbarium, have the flowers, inflorescence, and in most respects the habit of *Plathymenia*, *Adenanthera* and *Stryphnodendron*; the glands of the anthers are however small and often so fugitive that the bud must be opened carefully to find them still adhering, and the pod is that of an *Acacia*. The leaflets, as in the three above-mentioned genera, are broad and blunt, but the petioles appear to be constantly prickly. To this group I have given the generic name of *Piptadenia*.

Another set of near a dozen Brazilian species agree with *Piptadenia* in flowers and inflorescence, but the leaflets are very numerous, small, narrow, and pointed, which gives to the specimens the appearance of the true Acacias, or of the spicate-flowered Mimosas. I have seen the pod of but one species, and that is not ripe. If, as it appears to do, it agrees with that of the other *Piptadeniæ*, this group would form a section of that genus.

I have about eight species which I should refer to *Stryphnodendron* of Martius. Amongst these, Gardner's n. 364 from the Organ Mountains is S. *polyphyllum*, Mart.; his n. 986 from Pernambuco, is a new species closely allied to it; Blanchet's 2899 from the Sierra Acurua (to which belongs also probably his n. 2701 from the Serra Jacobina), is remarkable from the pod being flatter and much contracted between the seeds, but it appears to be a true *Stryphnodendron*. De Candolle's *Acacia psilostachya*, which I received from Cayenne, seems also to be referrible to this genus. *Mimosa Guianensis, Aubl. Pl. Gen.* II. *p.* 938 *t.* 357, has from that figure all the appearance of a *Stryphnodendron*, but the fruit is described as thin, membranous and bivalved, which would place it in *Piptadenia*. There are however so many instances where Aublet is known to have mismatched fruits and flowers, that there is no certainty of his correctness in this case, more especially as he gathered the flowering and fruit-bearing specimens at several months' interval.

The East Indian genera, *Adenanthera* and *Prosopis*, are

very near the two last, but apparently distinct, especially in the pod. *Algarobia*, comprehending nearly twenty American species, is also allied to *Stryphnodendron*, but with a very different habit, and the petals in most, if not in all, the species, are woolly inside. I find I was mistaken in following other authors in describing the anthers as eglandular; the stipitate glands exist, at least in many species, but they are so small and fall off so readily, that they can scarcely be seen in dried specimens, except in the bud. *Gagnebina* from the Mauritius, *Filloea* from tropical Africa, and *Lagonychium* from the Caucasian region, complete the list of thirteen genera of *Eumimoseæ* known to me, to which may perhaps be added *Gleditschia*, with the structure of the flowers of which I am not as yet perfectly acquainted.

260. Vachellia *Farnesiana*, Wight et Arn. *Fl. Penins. Ind. Or.* I. *p.* 272.—*Farnesia odora*, Gusparini ex Linnæa, v. XIII. Littbl. p. 134.—French Guiana. Leprieur, Herb. Par. n. 25.

This genus, distinguished from the great mass of Acacias by its pod, the flowers being precisely the same, appears to comprehend a considerable number of species, some of them American, where they are chiefly found in the West Indies, Mexico, Peru, and Chili; but perhaps the greatest proportion are African. So far as regards the American species, they form a natural group, and are easily distinguished from *Acacia*; but the African ones, with which it is true I am as yet but little familiar, seem to run much into the true *Acaciæ*. The greater number of the trees, however, which furnish the African gums, will probably be found to belong to *Vachellia*; but then the question arises, should not this group preserve the name of *Acacia*, and another appellation be given to the Australian *Acaciæ* and their congeners? In answer to this, I do not see any reason to go farther back than Willdenow, who first established *Acacia* as a genus, and included therein the whole of both groups; and as the number of species of that portion which includes the Australian ones is so very much the largest, and the other has already received a generic

name, it would produce infinitely less confusion to adopt the *Vachellia* of Wight and Arnott, and retain the name of *Acacia* for the Australian group.

261. Acacia *Westiana. DC. Prodr.* II. *p.* 464?—Folia fere *A. filicinæ*, sed glandula adest oblonga ad basin petioli et sæpius 1-2 minores inter pinnas extimas. Aculei ramorum et petiolorum minuti pauci. Panicula ampla divaricata terminalis, rachi pedicellisque conescentibus. Flores pentameri canescentes. Stamina numerosa omnino libera. Legumen non vidi.—Rio Branco. Schomburgk, n. 852, the specimens in flower:—the fruit specimens under the same number belong to *Mimosa acacioides.*

From the genus *Acacia*, as adopted by De Candolle, I should propose to exclude, 1. All the species with definite stamens, which will be found to belong to *Mimosa*, *Entada* or *Stryphnodendron*, or some perhaps to *Plathymenia* or *Piptadenia.* 2. All the species with very long purple or white stamina, more or less monadelphous at the base, amongst which *A. tetragona* and probably some others enter into my genus *Calliandra*, defined below, and *A. Lebbek*, with several others, chiefly Asiatic, constitute another new genus, having the flowers of an *Inga* with the pod of an *Acacia.* There will remain a mass of perhaps three hundred species chiefly Australian, but with several Asiatic and African species, and a considerable number of American ones, of which I have about forty in my own herbarium. The inflorescence is capitate or spiked, the corolla small, usually, perhaps always, gamopetalous and campanulate, the stamens numerous yellow and perfectly free, the pod bivalved, without any pulpy or cellular substance inside at its maturity, the valves membranous, coriaceous or woody, not rolling back elastically, but straight, curved, or twisted about in a variety of shapes.

262. Calliandra? *stipulacea* (sp. n.); pinnis 3-4-jugis, foliolis 8—12-jugis oblique oblongis obovatisve valde inæquilateris subcoriaceis glabris, petiolis eglandulosis ramisque glabriusculis, stipulis bracteisque lanceolatis cartilagineis, capitulis pedunculatis terminalibus fasciculatis, floribus sessilibus, calycibus

glabris, corollis adpresse pubescentibus.—Arbuscula. Foliola pleraque 6-8 lin. longa, circa 3 lin. lata, obtusiuscula, subtus pallida. Stipulæ et bracteæ persistentes circa 3 lin. longæ. Inflorescentia revera racemosa terminalis, sed rachis brevis et bracteæ cum basibus pedunculorum imbricatæ ita ut pedunculi fasciculati videntur. Calyx 1 lin. longus. Corolla infundibuliformis fere 4 lin., limbo $1\frac{1}{4}$ lin. longo. Stamina bipollicaria basi brevissime monadelpha. Antheræ hirsutæ. Pollinia in quoque loculo pauca, verosimiliter 2, sed in specimine meo jam fere omnia delapsa.—On the Rio Quitaro. Schomburgk, n. 582.

I propose the name of *Calliandra* for the genus indicated by De Candolle under *Inga anomala* as the *Anneslea* of Salisbury, a name applied by Dr Wallich to a very different East Indian genus. The *Calliandræ* may be essentially characterised by the stamens which are more or less monadelphous, and by the pod which is straight, linear, or oblong, flat, with the margins much thickened, of a woody coriaceous or submembranous texture, two-valved, the valves rolling back with more or less elasticity at their maturity from the apex to the base without twisting. The seeds are always attached by a very short funiculus. The species I have seen have all bipinnate leaves, globose heads of flowers, a gamopetalous corolla, campanulate or more frequently infundibuliform, very numerous stamina, many times longer than the corolla and generally purple, the anther small often more or less hispid and each cell containing two large pollen-masses. The insertion of the stamens is often perigynous, and in many species the central flowers have no ovary, and are otherwise dissimilar to the outer more perfect ones in each head.

Besides the 18 species of which the enumeration is subjoined, it is probable that several of the *Ingæ Samaneæ* and of the *Acaciæ globifloræ inermes* of De Candolle's Prodromus may belong to *Calliandra*. The species known to me are:—

1. C. *dysantha;* ramulis pubescentibus, pinnis 4—5-jugis, foliolis multijugis (4—6 lin. longis) falcato-oblongis rigidis coriaceis supra glabris pilosisve subtus pubescentibus, stipulis

lanceolatis fuscis, bracteis lato-ovatis, capitulis sessilibus interrupte fasciculato-spicatis, calycibus corollisque rufo-hirsutissimis, leguminibus . . . .—Minas Geraes, P. Claussen.

2. C. *Houstoni.—Mimosa Houstoni, L'Hér.—Acacia Houstoni.* Willd.—*Inga Houstoni,* DC.

3. C. *grandiflora.—Mimosa grandiflora. L'Hér.*

4. C. *Kunthii.—Inga anomala.* Kunth.—Antheræ villosæ, pollinia ovoidea.

5. C. *microphylla;* pinnis circa 20-jugis, foliolis multijugis densis minimis (vix 1 lin.) imbricatis linearibus mucronatis subcoriaceis glabris, petiolo puberulo eglanduloso, capitulis axillaribus breviter pedunculatis, floribus . . . . ., leguminibus lignosis velutinis.—Minas Geraes. P. Claussen.

6. C. *tetragona.—Acacia tetragona.* Willd.—Antheræ minute puberulæ, pollinia subglobosa.

7. C.? *stipulacea,* supra.

8. C. *filipes;* ramulis petiolisque puberulis glabratisve, pinnis 3—4-jugis, foliolis plerumque 10—16-jugis dimidiato-oblongis v. oblongo-lanceolatis (4-6 lin.) falcatis inæquilateris membranaceis mucronulatis glabris junioribus ciliatis, glandulis parvis in petiolo tetragono sparsis, stipulis falcato-lanceolatis, pedunculis filiformibus ad axillas fasciculatis, calycibus corollisque glabris, leguminibus . . . .—Brasilia. Pohl.—Antheræ glabræ. Pollinia depresso-globosa, cruciatim 4-lineata, 8-sulcata.

9. C. *scutellifera;* foliis ramulisque junioribus puberulis demum glabratis, pinnis 2—3-jugis, foliolis (4-6 lin.) 6—9-jugis oblique obovato-oblongis falcatis inæquilateris membranaceis, glandula scutelliformi majuscula ad basin petioli, parvis inter pinnas omnes, stipulis linearibus parvis, pedunculis filiformibus ad axillas fasciculatis, calyce corollaque glabris, legumine submembranaceo minute puberulo suturis crassis.—Ribeira. Herb. Acad. Petropol.

10. C. *bicolor;* humilis, foliis junioribus ramulisque pilosis, pinnis 4—6-jugis, foliolis (2 lin.) multijugis oblongo-linearibus obtusiusculis glabris ciliatisve, stipulis lanceolato-subulatis, petiolis eglandulosis, pedunculo axillari solitario medio

subbracteato rigidulo, floribus glabriusculis, legumine. . . . . —Stamina basi alba apice purpurea. Uruguay, Tweedie.—I have another species allied to this one in Claussen's collection, but the specimen is not sufficiently perfect to characterize it.

11. C. *Tweedii;* humilis, foliis subtus ramisque pilosis, pinnis 3—4-jugis, foliolis (2 lin.) multijugis oblongo-linearibus obtusiusculis, petiolis eglandulosis, stipulis ovato-lanceolatis, bracteis lato-ovatis, pedunculis axillaribus terminalibusque solitariis paucisve, calycibus corollisque villosissimis, legumine . . . .—Mountains of Rio Jaqury. Tweedie.

12. C. *Cumingii;* humilis? pinnis 2—3-jugis, foliolis (2 lin.) multijugis oblongo-linearibus obtusiusculis glabris v. parce pilosis, petiolis eglandulosis puberulis, stipulis bracteisque parvis lanceolato-subulatis, pedunculis terminalibus solitariis? medio bracteatis, calycibus corollisque pilosiusculis, legumine . . . .—Panama. Cuming, n. 1248.

13. C. *macrocephala;* foliis ramulisque pilosis v. demum glabratis, pinnis distantibus 3—4-jugis, foliolis (3 lin.) multijugis ovato-oblongis obliquis falcatis valde inæquilateris mucronatis reticulato-venosis, stipulis lineari-lanceolatis falcatis, pedunculis axillaribus terminalibusque elongatis apice bracteatis, calycibus corollisque extus rufo-hirsutis, legumine . . . . —Flores *C. Kunthii.*—Brasilia. Pohl.

14. C. *virgata;* ramulis vix puberulis, pinnis unijugis, foliolis (4—6-lin.) multijugis oblique cordato-lanceolatis acutis rigidis glabris supra nitidis, petiolo eglanduloso, stipulis parvis lanceolatis, pedunculis axillaribus terminalibusque elongatis subsolitariis apice bracteatis, floribus glabriusculis, legumine . . . .—Stamina ultra corollam longiuscule et inæqualiter monadelpha.—Brasilia. Pohl.

15. C. *fasciculata;* glabriuscula, pinnis 2—4-jugis, foliolis (3 lin.) multijugis falcato-linearibus basi obliquis subcordatis supra nitidis glabris, petiolo eglanduloso, stipulis . . . , pedunculis axillaribus fasciculatis brevibus, floribus . . . , legumine lignoso glabro.—Brasilia. Pohl.

16. C. *brevipes;* glabriuscula, pinnis unijugis, foliolis

(1—1½ lin.) multijugis oblongo-linearibus falcatis obtusiusculis glabris, petiolo brevi eglanduloso, pedunculis brevibus terminalibus subfasciculatis, calyce parvo corollaque late campanulata glabris, legumine coriaceo glabro.—Brasilia. Pohl.

17. C. *sessilis;* glabra, pinnis unijugis, foliolis (2 lin.) multijugis falcato-oblongis obtusiusculis glabris, petiolo brevissimo eglanduloso, capitulis sessilibus terminalibus, calycibus corollisque glabris striato-venosis, legumine . . .—Sierra Acurua, Blanchet, n. 2816.—Ramuli floriferi breves, stipulis post folia delapsa persistentibus distiche imbricatis.

18. C. *umbellifera;* ramulis viscoso-puberulis, pinnis 1—2-jugis, foliolis (1-2 lin.) multijugis ovali-oblongis obtusis subciliatis, bracteis stipulisque lato-lanceolatis induratis, petiolis brevibus pubescentibus, pedunculis axillaribus terminalibusque, floribus (1-2 centralibus exceptis) longe pedicellatis glabriusculis, legumine membranaceo-coriaceo glabro.—Stamina insigniter perigyna.—Ceará, Brazil. Gardner, n. 1581.

263. Calliandræ? v. Pithecolobii? sp.—Pedrero. Schomburgk, n. 874.—I do not now describe this plant, because I am unable to refer it to either of the above genera without much doubt. The foliage is that of several *Calliandræ*, the flowers are more those of a *Pithecolobium.*

264. Pithecolobium *pubescens.*—*Inga pubescens,* Bert. in DC. Prod. II. p. 437.—Foliola nunc fere ovata, nunc oblonga v. lanceolata, semper valde inæquilatera et obliqua.—British Guiana. Schomburgk, n. 750.

265. Pithecolobium *lasiopus* (sp. n.); ramulis petiolisque rufo-hirtis, foliis conjugato-pinnatis, foliolis 2—3-jugis inæqualibus ovali-oblongis obtuse acuminatis extimis basi obliquis supra nitidis utrinque glabris v. supra ad nervos puberulis, glandula inter pinnas et inter paria omnia, spicis capitatis subsessilibus ramealibus, corollis calycibusque aureo-pubescentibus.—Affine ex descr. *P. caulifloræ* (*Ingæ caulifloræ,* Willd.) sed imprimis pubescentia florum diversum. Frutex est ramis cinereis teretibus verrucosis. Petioli communes brevissimi, partiales pollicares. Glandulæ depressæ hirsutie petiolorum obtectæ, foliola inferiora pollicaria penninervia,

extima 2—3-pollicaria basi sæpe uno latere 2—3-nervia. Spicæ capituliformes (*umbellæ* auctorum) in ramis fasciculatæ, pleræque breviter pedunculatæ, nonnullæ omnino sessiles. Rachis et flores pilis appressis aureis pubescentes. Calyx ½ lin., corolla fere 3 lin. longa. Staminum tubus corolla duplo longior, pars libera tubo æquilonga. Legumen non vidi.—British Guiana. Schomburgk, n. 487.

266. Pithecolobii? v. Enterolobii? sp.—Falls of the Essequibo and Rupunoony. Schomburgk, n. 530.—This is again a species that, without better specimens, I do not venture to refer, with any degree of certainty, to either of the above genera.

267. Pithecolobium *trapezifolium.*—*Mimosa trapezifolia.* Vahl.—*Inga trapezifolia, DC. Prod.* II. *p.* 441.—British Guiana. Schomburgk, n. 284. French Guiana. Martin.

Pithecolobium is evidently a numerous genus, common to the tropical regions in both the new and the old world, and, as to the greater number of species, is natural and well characterised by the flower as well as the pod; there appear, however, to be some exceptions to Martius' characters. The *Inga tergemina* for instance, which cannot be separated from *Pithecolobium*, has in all the specimens I have seen a straight pod, and some species, without the pod, cannot be distinguished from *Inga.*

Of *Enterolobium* of Martius I possess none but flowering specimens, from which, as well as from the figures quoted of the pod, I should be inclined to consider it but as a section of *Pithecolobium.*

268. Inga (Euinga?) *sapida, Humb. et Kunth, Nov. Gen. et Sp.* VI. *p.* 286?—Flowers in nearly sessile lateral heads as in several *Pithecolobia,* but the foliage is that of the *Euingæ alatæ,* and answers to Kunth's description. The pod is unknown to me.—British Guiana. Schomburgk, n. 595.

269. I. (Euinga alatæ) *platycarpa* (sp. n.); ramulis petiolis pedunculisque laxe villosulis, petiolo alato, foliolis bijugis amplis ovatis breviter et abrupte acuminatis basi rotundato-cuneatis coriaceis nitidis supra glabris v. ad venas pubescen-

tibus, subtus villosulis, glandula maxima inter quodque par, pedunculis ramealibus petiolo subæquilongis, spicis brevibus subcapitatis, floribus tenuibus villosis, legumine plano utrinque marginato demum glabrato.—Frutex elatus. Foliola majora sæpe 10 poll. longa, 6 poll. lata, inferiora cujusve folii sæpius dimidio minora. Petiolus infra par infimum 6—12 lin. longus, inter juga duplo longior. Pedunculi simplices. Calyx 3 lin. longus parce et adpresse pilosus. Corolla plusquam duplo longior dense strigoso-pilosa. Staminum tubus vix corollam excedens. Legumen 3—6-pollicare, 1—1½ poll. latum, nigrum, crassiusculum inter semina sæpe contractum, sutura utraque incrassato-marginata.—On the Essequibo and Rupunoony. Schomburgk, n. 534.

270. I. *pilosiuscula, Desv.—DC. Prod.* II. *p.* 432.—French Guiana. Leprieur, Herb. Par. n. 23 and 40.—I have also *I. setifera*, DC., from Martin's Guiana collection.

271. I. (Euinga alatæ) *floribunda* (sp. n.); ramulis foliisque glabris, petiolo alato infra foliolo inferiore brevissimo, foliolis bijugis ovatis breviter acuminatis basi rotundatis inæqualibus, glandula maxima inter quodque par, spicis oblongis basi subinterruptis pedunculatis in paniculas densas axillares terminalesque dispositis, floribus villosis.—Arbor excelsa. Foliola 3—5-pollicaria. Petiolus infra par infimum vix 2 lin. longus subteres, inter juga 1—1½-pollicaris cuneato-alatus. Pedunculi secus rachin communem solitarii v. gemini 1—2-pollicares. Calyces 5 lin. Corolla vix duplo longior. Staminum tubus corollam subæquans. Legumen non vidi. —British Guiana. Schomburgk, n. 364.

272. I. (Euinga alatæ) *stenoptera* (sp. n.); ramulis foliisque utrinque pilis brevibus deciduis hirtis, petiolo anguste alato, foliolis bijugis oblongis acutis basi angustatis subcoriaceis nitidis, pedunculis axillaribus binatis petiolum æquantibus apice breviter capitato-spiciferis, floribus villosis.—Affinis ex descr. *I. nitidæ*, Willd. Foliola 1½—3-poll., extima 4—5-poll. longa, basi valde inæquilatera.—Rio Branco. Schomburgk, n. 795.

273. I. (Euinga alatæ) *disticha* (sp. n.); ramulis foliisque

utrinque pilis minutis scabris, petiolo alato, foliolis 4-jugis ovali-oblongis acuminatis basi angustatis membranaceis, pedunculis axillaribus fasciculatis, floribus distiche spicatis, bracteis lanceolatis deciduis calyce parum brevioribus, floribus villosis.—Affinis ex descr. *I. spuriæ*, Humb. et Kunth, et præsertim inflorescentia et bracteis diversa.—Common along the Essequibo. Schomburgk, n. 25.

I have besides about thirty Brazilian *Euingæ alatæ*, and seven or eight *apteræ*.

274. I. (Euinga apteræ) *corymbifera* (sp. n.); ramulis junioribus pubescentibus demum glabris, petiolo aptero subtereti pubescente, foliolis 4-jugis ovali-oblongis acute acuminatis obliquis supra ad venas et subtus minute pubescentibus, spicis ovatis pedunculatis fasciculatis ad apices ramorum subcorymboso-paniculatis, rachi pedunculisque rufo-pubescentibus, calycibus pubescentibus, corollis strigoso-villosis.—Petiolus 4—6-pollicaris. Foliola inferiora 2—3 poll., ultima 4—5 poll. longa, supra opaca, subtus in sicco fusca. Glandulæ inter omnia paria. Flores tenues semipollicares, corolla calyce vix duplo longior.—British Guiana. Schomburgk, n. 226, of some sets only.

275. I. (Euinga? bipinnata) *adianthifolia*, *Kunth.*—*DC. Prod.* II. *p.* 440.—On the Essequibo. Schomburgk, n. 320.—The flowers are those of an *Euinga*, but the pod is unknown.

276. I. (Leptinga) *brevipes* (sp. n.); ramulis foliis et inflorescentia molliter puberulis, petiolo alato, foliolis bijugis ovatis oblongisve acuminatis basi rotundatis subcordatisve, pedunculis brevissimis, bracteis parvis, pedicellis calyce longioribus, floribus tenuibus tomentosis.—Arbor 30—40-pedalis, ramis pendulis. Stipulæ subpersistentes lineares acutæ. Petiolus infra par infimum pollicaris, fere a basi alatus, inter foliola duplo longior ad medium alatus. Foliola 2-5 poll. longa. Flores rosei. Calyx 2½ lin. longus. Corolla calycem 2 lineis superans. Stamina coccinea, tubo corolla parum longiore.—British Guiana. Schomburgk, n. 740.

277. I. (Leptinga) *sertulifera*, *DC. Prod.* II. *p.* 436.—French Guiana. Leprieur, Herb. Par. n. 56.

278. I. (Leptinga) *umbellifera, DC. Prod.* II. *p.* 432.—A shrub. British Guiana. Schomburgk.

The three last, together with *I. flagellifera*, Mart., and three others I have from Brazil, are remarkable from their umbellate inflorescence, the pedicels being very numerous, slender, and half an inch or more in length. Amongst them Blanchet's n. 2833, and Gardner's n. 2138, have a very distinct habit and large foliaceous stipules. They probably should form a separate section or perhaps even a genus, were the fruit known.

Another group of *Ingæ spuriæ*, includes *I. fruticosa*, Mart., *I. Diadema*, Mart., probably also Cuming's n. 1282, and a few others. I should propose for it the sectional name *Diadema.* The flowers are in globose heads, usually hanging from the end of a long axillary peduncle.

279. I. (Bourgonia) *Bourgoni, DC. Prod.* II. *p.* 434.—Banks of rivers, British Guiana. Schomburgk, n. 471.—This is one of a third section comprised in the *Ingæ spuriæ* of Martius, and characterised chiefly by the long loose spikes of small flowers. I have above twenty species including Gardner's Nos. 365 and 985.

280. Parkiæ sp.—Rio Negro, Schomburgk, n. 973. The leaves sent under the same number belong to *Heterostemon mimosoides*, Desf., so that I am unable to determine which species of *Parkia* this is. The flowers are those of the original *Mimosa biglobosa*, or *Parkia Africana*, Br.

This genus has been considered by Wight and Arnott as forming a distinct subtribe, on account of the imbricated æstivation of the corolla pointed out by Brown. This imbrication is however but slight; and the petals are, as in *Inga*, connected so far up in a tube, that upon the whole, in their arrangement, they are perhaps not so different from *Inga* as may be supposed at a first view. I am however only acquainted with three species, *P. Africana*, *P. biglandulosa*, and a new Brazilian one, (Blanchet n. 2868, and Gardner, n. 1582), and I have never seen *Erythrophleum*, the other genus

mentioned by Brown as a *Mimosea*, with imbricately æstivated petals.

(The genus of *Cæsalpinieæ*, which in the last number, p. 84, I dedicated to Martius, should, I understand, be spelt *Martia*, and not *Martiusia*.)

VII.—*Descriptions of Two new* FUNGI, *in the Collection of* SIR W. J. HOOKER; *by the* REV. M. J. BERKELEY, M.A., F.L.S.

[TAB. V.]

Lentinus (Scleroma) *fasciatus;* pileo 2-unciali tenui-coriaceo cyathiformi margine involuto pallidè ochraceo-fulvo fasciculato-hispido, pilis brevibus rectis nec crispis nec squarrosis.

Lamellis obconico-decurrentibus pallidè ligneis, margine integerrimo plus minus fusco, distantibus, latiusculis, brevioribus intermixtis, basibus velutinis indeque fasciatis.

Stipite $2\frac{1}{2}$ unc. alto, $\frac{1}{4}$ unc. crasso, è massâ spongiosâ more subgeneris prodeunte, suprâ cum pileo cyathiformi confluente, velutino-hispido, fulvo, intus albo.

This species is given in the account of some Fungi from Van Dieman's Land, in the *Annals of Nat. Hist. v.* III. *p.* 322, as *Lentinus villosus*, Kl. In so doing I had in view the description given of that species in the Linnæa. But it appears that the specimens communicated by Klotzsch to Fries, and described in the *Synopsis Lentinorum*, and in the *Epicrisis Fungorum*, do not accord with this description; neither do those marked by that name in Sir W. J. Hooker's Herbarium, which are evidently what was sent to Fries. From these the present species entirely differs, belonging as it does to the subgenus *Scleroma*. It is allied to *Lentinus furfurosus* and *L. velutinus*.

Sphæria *semi-orbis;* $\frac{1}{2}$—1 lin. lata hemisphærica subcarnosa ochracea, cortice obscuriore, disco planiusculo subinde depresso, peritheciis ellipticis pallidis, ostiolis minutis.

On bark. HAB. unknown.

Fig. 1

Lentinus fasciatus.

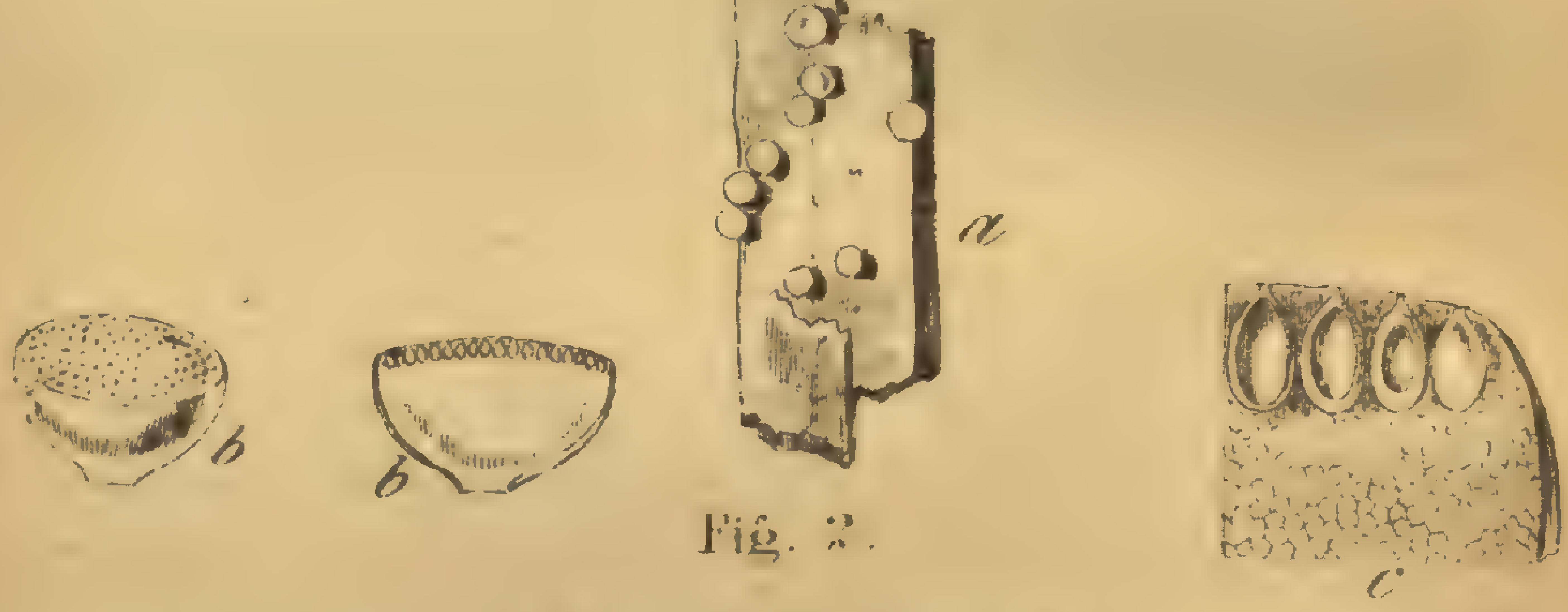


Fig. 2.

Sphæria semi-orbis.

Fagus antarctica.

This interesting *Sphæria* belongs to the series *Hypocrea* of the tribe *Poronia*, and is allied to *Sphæria Pocula*, Fr., resembling at first sight *Sphæria rufa*. The form however is constant, and the perithecia entirely confined to the disc. I regret that I can give no further analysis, the sporidia and asci being imperfect. I have seen only a few specimens; but as far as I can judge from them, the stroma seems to burst through the bark, and is at length left free upon the wood.

TAB. V.—*Fig.* 1. a. *Lentinus fasciatus: nat. size.*—b. Section of do.

Fig. 2.—a. *Sphæria semi-orbis: nat. size.*—b. b. Section of ditto, *magnified.*—c. Portion of section; highly *magnified.*

VIII.—*On the* FAGUS ANTARCTICA *of Forster, and some other species of Beech of the Southern Hemisphere; by* SIR W. J. HOOKER.

[TABS. VI. VII. VIII.]

OF the *Fagus antarctica* of Forster, nothing seems to have been published, except the few notes of that author in the "*Comment. Goett.* IX. *p.* 24," and those given by Willdenow; but to both these botanists the flowers and fruit were unknown. Mirbel, in his "*Description de quelques espèces nouvelles de la famille des Amentacées,*" in the 14th vol. of the *Mémoires du Muséum d' Histoire Naturelle*, has taken some pains, at page 469, to prove that his *Fagus betuloides*, is distinct from it, judging from Forster's description; and at p. 472 of the same volume, where he enumerates the known species of Beech, he says, "Je ne cite le *Fagus antarctica* de Forster, parceque la description ne dit rien de la fleur femelle, qui, jusqu' à présent, n'est pas connue." In my Herbarium, amongst the plants collected by the officers of Capt. King's Voyage, in H. M. Ships Adventure and Beagle, sent to survey the southern extremity of South America, Terra del Fuego, &c., is a specimen of what I conceive to be Forster's plant, gathered in the Straits of Magalhaens, and it is no doubt the species

alluded to in the "*Geography of Terra del Fuego and the Straits of Magalhaens*,"* by Capt. King himself, when, speaking of Mesier Channel, he says, "the trees here are nearly of the same description as those which are found in all parts between Cape Tres Montes and the Strait of Magalhaens. Of these, the most common are an evergreen Beech, (*Fagus betuloides*) and a birch-like Beech, (*Fagus antarctica*)" &c.—The *Fagus betuloides*, Capt. King informs us, grows to a very large size: one tree, supposed to be the same as that noticed by Commodore Byron at Port Famine, measured "seven feet in diameter, at seventeen feet above the roots, and there divides into three large branches, each of which is three feet through." This is a circumstance that would not be anticipated from the appearance of the specimens in our Herbarium, whose short branches, and small and closely placed evergreen leaves, give the idea of a dwarf and very compact shrub. The size to which the *F. antarctica* attains, Capt. King does not state; but from a passage in the memoir just quoted, it would seem to constitute a tree of no small dimensions. "Besides the evergreen Beech (*F. betuloides*,) above-mentioned, there are few other trees in the Strait that can be considered as timber. Such an appellation only belongs to *two other species of beech* and the *Winter's Bark*." Of these *two* other kinds of Beech, the one is no doubt the species in question, (*F. antarctica*) and the second is what I take to be the *Betula antarctica*, Forster, as shown by specimens in my own Herbarium, gathered during the same voyage, and marked "*Beech* from Port Famine," and which are precisely the same as a *Betula* or *Fagus* in my possession without name, gathered by Forster in the Straits of Magalhaens, and which sufficiently accords with Willdenow's brief character of the *Betula antarctica*. It must be confessed indeed, that this plant does come very near the *Fagus betuloides* of Mirbel, yet I think it is distinct, at least as to species; and the flower and fruit being unknown (apparently) to Forster,

* In the Journal of the Royal Geographical Society of London, Vol. I. p. 160.

and certainly to Willdenow and to me, I think it will be safer to refer it to *Fagus*, on account of its striking affinity with Mirbel's *Fagus betuloides*. Hitherto I believe no certain species of *Betula* has been found in the Southern Hemisphere. Mirbel, judging Willdenow's description, for he had no means of access to an authentic specimen, says, in speaking of his *Fagus betuloides*,—" mais il faudra probablement rapporter comme synonyme de ceci le *Betula antarctica* de Forster, décrit par Willdenow (*Sp. Pl.* IV. *p.* 466) sur des échantillons sans fleurs ni fruits. Forster lui-même en donne simplement le nom dans un liste de plantes recueillies par lui, sans fleurs, aux terres Magellaniques. (*Comment. Goett.* IX. *p.* 42.) Commerson, qui a recolté dans les mêmes contrées les échantillons sur lesquelles j'ai fait ma description, et qui remarque dans ses notes qu'ils proviennent d' un arbre formant des vastes forêts sur toutes les côtes, les a également étiquetés *Betula antarctica*. Je puis encore m'appuyer de l' autorité du celebre Vahl, qui a écrit le mème nom au bas d'un échantillon que M. Ad. de Jussieu a bien voulu me confier. Enfin la description que Willdenow a publiée du *Betula antarctica* s'applique tres-bien au *Fagus betuloides*, et il ne se trompe sur le genre que parceque l' échantillon qu'il a eu sans les yeux étoit dépourvu de fleurs." All this proves the extreme difficulty of ascertaining Forster's plant, without having recourse to an authentic specimen, and such I may consider mine to be, being gathered by Forster himself, though not named by him: and I shall presently notice it again under the appellation of *Fagus Forsteri*. I now proceed to describe what I take to be the true

Fagus antarctica;

Foliis oblongo-ovatis obtusis basi suboblique truncatis coriaceo-membranaceis inæqualiter dentato-serratis subtus minute reticulatis, (junioribus plicatis,) cupulis involucriformibus profunde 4-partitis laciniis inæqualibus integris dorso simplici serie fimbriato-squamosis, nucibus superne ciliatis. —(Tab. VI.)

Hab. Straits of Magalhaens. *Capt. King.* (Specimen here represented from Port Famine.)

Arbor. Ramuli distichi, breves, subtortuosi, rugosi, atro-fusci, nitidiusculi, juniores solummodo parce pubescentes. Folia disticha, approximata, unciam longa, basi vix ¾ unciam lata, oblongo-ovata valde obtusa, subcoriaceo-membranacea, glabra, pinnatim venosa, venis obliquis subtus prominentibus atque minute reticulatis, margine inæqualiter dentato-serratis etiam obscure lobatis, dentibus obtusis; basi suboblique truncatis; petiolo vix 3 lineas longo, gracili, glabro. Flores masculi absunt in examplaribus meis:—fœminei axillares. Cupula solitaria, sessilis, magnitudine pisi communis, coriacea, profunde 4-partita, laciniis inæqualibus sæpe duabus longioribus liberis, duabus brevioribus magis minusve coadunatis, omnibus oblongo-linearibus integris integerrimisque, ciliatis, dorso simplici serie squamosis, squamis ciliatis. Nuces 3 in singula cupula, cordatæ, exteriores trigonæ trialatæ, et plerumque tristylosæ, intermedia compressa bialata et plerumque bistylosa; alis superne ciliatis.

Tab. VI.—*Fagus antarctica. Fig.* 1. Leaves; *f.* 2. Cupule with nuts: *f.* 3. Empty cupule; *f.* 4, 5. Nuts:—*magnified.*

It has been long known that a species of Beech inhabited Van Dieman's Land. Mirbel, who in the volume of the *Mémoires du Muséum d' Hist. Nat.* above quoted, enumerates all the then known species of the Genus, adds "Je ne cite le *Fagus* qui, selon Cunningham, (*King's Survey of the Coasts of Australia, vol.* I. *p.* 158), croit à la Terre de Dieman; mais elle n 'est encore décrite ni nommée." The allusion to it in King's "*Australia,*" by Mr Allan Cunningham, is where that distinguished traveller and botanist gives an enumeration of the several species of trees that grow at Pine Cove, Van Dieman's Land, and when he says "Amentaceæ. *Fagus:* Native Birch. Height 40 feet. Diameter at the base of the trunk 12—14 inches."—Original specimens gathered by Mr Cunningham at this place (Pine Cove), are now before me.

In 1831 and 1833 I received specimens from the late Mr Lawrence, marked, "*Betula antarctica*," but without flower or fruit. Under this name it is alluded to in Mr Backhouse's very interesting account of the "most common and remarkable Indigenous Plants of Van Dieman's Land, given in the *Van Dieman's Land Almanack* for 1835, and republished in *Hooker's Companion to the Botanical Magazine*, Vol. II. *p.* 65.—"*Betula antarctica*," that intelligent gentleman observes, "or *Australian Myrtle*, is a beautiful dark green-leaved tree, growing in many parts of the island, and forming the great 'Myrtle-forest,' twenty miles long, in Emu Bay. It is found on the side of Mount Wellington, but has not yet been successfully introduced into gardens. This tree, however, is not a species of *Betula*; the young shoots, in their earlier stages, appearing to have been mistaken for the male blossoms by the English botanists."

In 1837 and 1838, I had the pleasure to receive numerous specimens from my invaluable correspondent Mr Gunn, and from Dr Milligan. From these gentlemen we learn that it is a tree, forming in the western parts of Van Dieman's Land, dense forests, where the land is always of the richest quality; and of so umbrageous a character are they, that cryptogamous plants alone can exist beneath them, or trees and shrubs of peculiar habits. Herbaceous plants, as far as can be recollected, are rarely or never seen beneath their shade. The timber resembles Elm in appearance, and trees have been measured, whose trunks are upwards of thirty feet in circumference. Dr Milligan found it difficult to procure specimens with female flowers, well displayed, on which also are male blossoms, the former being axillary, and developed only with the growth of young wood, after the latter are fully disclosed on bracteas. When the female flowers are much advanced, we consequently find no male blossoms, but on some of our specimens we have remarked both; as shown in our figure. I shall dedicate this plant to the zealous botanist, who, if not the first to notice the plant, is, as far as I know, the first who has referred it to its proper Genus.

Fagus Cunninghami.

Foliis deltoideis coriaceis grosse inæqualiter dentatis (junioribus non plicatis) obsolete nervosis, cupulis capsuliformibus demum profunde 4-partitis, laciniis lanceolatis spinis mollibus apice glandulosis obsitis.—(Tab. VII.) β. foliis majoribus subrhombeis. γ. foliis minoribus cordatis magis coriaceis basi concavis apice subreflexis.

Hab. Van Dieman's Land. Pine Cove, Macquarrie Harbour. *Allan Cunningham, Esq.* Emu Bay, and on the side of Mount Wellington. *James Backhouse, Esq.* Frequent in the western parts of Van Dieman's Land. *Dr Milligan. Ronald Gunn, Esq.*

Arbor, trunco robusto nunc 9—10-pedem diametro. Ramuli breves, graciles, rectiusculi, distiche inserti, atro-fusci, juniores velutini. Gemmæ terminales axillaresque, fere unciam longi, glutinosi, stipulati, amentiformes. Stipulæ oblongæ, concavæ, flavo-fuscæ, nitidæ, deciduæ. Folia approximata, alterna, disticha, coriacea, semiunciam ad unciam longa, planiuscula, deltoidea; in β. inferne attenuata, inde rhomboidea; in γ. cordata; obscure penninervia, margine grosse inæqualiter dentata, sublobata, juniora viscosa seu potius vernicosa, non plicata. Petioli perbreves, vix lineam longi, pubescentes. Flores masculi solitarii, brevi-pedicellati, ex axillis foliorum in ramulos novellos. Perianthium membranaceum, fuscum, monophyllum 5—7-fidum, basi attenuatum, extus pubescens, laciniis acutis patentibus. Stamina 8—9. Flores fœminei terni, axillares, in ramulos juniores. Cupula solitaris, sessilis, capsuliformis, ovata, demum profunde 4-partita, laciniis erectis, lanceolatis, extus spinis mollibus patentibus pluriseriatis (in singula serie spinis plerumque 3) apice glandulosis obsitis. Nuces 3, quarum exteriores plerumque trigonæ, trialatæ, intermedia compressa bialata, alis superne productis. Styli 2—3 breves.

Tab. VII.—*Fagus Cunninghami.* *Fig.* 1. Var. β. *nat. size; f.* 2. Male Flower; *f.* 3. Male perianth; *f.* 4. Stamen; *f.* 5. Cupule with nuts; *f.* 6. Empty cupule; *f.* 7, 8. Nuts:—*magnified.*

Fagus Cunninghami.

I shall terminate this paper with an enumeration of all the species known to inhabit the southern hemisphere. In the *Species Plantarum* of Willdenow, Persoon and Sprengel, only one is mentioned, and most imperfectly characterized, the *Fagus antarctica* of Forster. Mirbel added four new species, of which number he considered one to be doubtful, and Dr Poeppig four. The number now amounts to eleven, if we are correct in referring the *Betula antarctica* to this genus, of which I think there can be no doubt. It will be seen that, with the exception of *F. Cunninghami*, all are inhabitants of Chili or of the Chilian Andes, and of the southern extremity of South America. Mirbel divides the species of *Fagus* known to him, into two groups, as follows:—

Sect. I. Cupula muricata, capsuliformis; ovaria inclusa; folia juniora plicata. *Fagus sylvatica. F. ferruginea. F. obliqua.*

Sect. II. Cupula involucriformis, segmentis angustis laciniatis, ovaria lateribus exserta; folia juniora non plicata. *Fagus Dombeyi. F. betuloides. F. dubia?*

But in our Australian *Fagus*, the involucriform cupula, is not accompanied by the *folia juniora plicata*. I shall therefore take the divisional characters from the leaves alone.

* *Folia impari-pinnata.*

1. F. *glutinosa* (Poep. et Endlich.); fruticosa humilis foliis impari-pinnatis uni-v. bijugis, petiolis pilosis, foliolis utrinque hirto-pubescentibus glutinosis serratis terminali elliptico, lateralibus oblongis basi inæqualibus. *Poep. et Endlich. Nov. Gen. et Sp. Pl. Chil. &c., p.* 68.

Hab. Fissures of rocks in the coldest regions of the southern Andes of Chili. *Poeppig.*—Flowers and fruit unknown.

** *Folia simplicia submembranacea, juniora plicato-venosa.*

2. F. *obliqua* (Mirb.); foliis ovato-oblongis obliquis subrhomboideis obtusis duplicato-serratis, basi integris in petiolum attenuatis pilosiusculis, perianthiis masculis solitariis hemisphæricis sinuatis 30—40-andris, cupulis capsulifor-

mibus muricatis 4-partitis segmentis ovatis obtusis, ovariis inclusis triquetris, angulis alatis. *Mirb. Descr. Ament. Nouv. in Mém. du Mus. d'Hist. Nat. v.* XIV. *p.* 465. *t.* 4.

Hab. Chili; at Conception, and in the interior of the provinces of Southern Chili, at an elevation of from 1000 to 5000 feet. *Dombey. Dr Gillies. Captain Beechey. Cuming.*

3. F. *procera* (Poep. et Endlich.); ramulis petiolisque hirtis, foliis oblongis acutiusculis duplicato-serratis subtus pubescentibus discoloribus. *Poep. et Endlich. l. c. p.* 69. *t.* 197.

Hab. Mountain woods in southern Chili; at Antuco. *Poeppig.* Abundant near Valdivia. *Bridges* (*n.* 634).—The flowers and fruit are unknown to Dr Poeppig: but the latter is abundant on Bridges' specimens which I have referred, though I own, rather doubtfully, to this species. I had considered them to be a variety of *F. obliqua:* but the leaves are certainly larger, but not so large nor so very elliptical as those represented by Poeppig and Endlicher; the under side is very pale, slightly hairy, the scales or soft spines of the cupule are larger than in *F. obliqua.* The station of Valdivia may be considered the same as that of Antuco:—and I am almost confirmed in its being identical with the *F. procera*, by the respective remarks of these two travellers. Bridges states that it is called *Roble*, and *Pillin-timber*, by the natives, and that it attains a height of from 60 to 100 feet. —Poeppig says, "it is a tree from 80 to 100 feet high, that it is called *Rauli* by the Chilenos, and that its white and very hard wood is much valued for ship-building. Cups and platters are made from the burnt trunks which lie prostrate in the forests after great conflagrations, and are sold under the name of *Pellin;* whence the Chilian word *Appelinar*, to carbonize the outside of a tree, so that the wood within may become harder. These *Pellins* are remarkable for their hardness and fragility." Judging from my specimens of *F. obliqua*, I should say that it is liable to a good deal of variation in the size and outline of the leaves.

4. F. *pumilio* (Poep. et Endl.); truncis decumbentibus,

ramis ascendentibus, ramulis verrucosis, foliis ellipticis obtusis basi truncatis duplicato-serratis utrinque petiolisque hirto-pubescentibus. *Poep. et Endlich. l. c. p.* 68. *t.* 195.

HAB. Andes of Southern Chili, clothing the summits of ridges which attain to a height of from 6000 to 8000 feet. *Poeppig.*—Flowers and fruit unknown. The habit and shape of the leaves are very similar to those of *F. antarctica.*—Dr Poeppig remarks that this is a short prostrate tree, 8—12 feet long, with a mode of growth not unlike that of *Pinus pumilio.* It marks the transition zone from the erect trees, whose superior limit is indicated by the *Fagus alpina*, to the frigid region, where snow lies for eight months of the year, and where the shrubby *Compositæ*, and the *Violets* that grow in dense capitate tufts, and other handsome plants, abound.

5. F. *antarctica*, (Hook.—supra).—(TAB. VI.).

HAB. Terra del Fuego, and both sides of the Straits of Magalhaens. (v. supra).

*** *Folia simplicia, coriacea, juniora non plicata.*

6. F. *Dombeyi* (Mirb.); foliis ovato-lanceolatis subrhomboideis acutiusculis serratis coriaceis nitidis glabris basi oblique cuneatis subpetiolatis, perianthiis masculis ternis campanulatis 4—5-lobis 8—10-andris, cupulis involucriformibus lævigatis quadripartitis segmentis sublinearibus laciniatis, ovariis lateraliter exsertis triquetris angulis marginatis.—*Mirb. l. c. p.* 467. *t.* 5. *Poep. et Endlich. l. c. p.* 69.

HAB. Chili, Conception. *Dombey.* Banks of streams in the vallies of the Andes in Southern Chili. *Poeppig. Cuming,* (without fl., or fr.).—According both to Dombey and Poeppig, this forms a lofty tree called by the natives *Coygué.* It affords a useful wood.

7. F. *betuloides* (Mirb.); foliis ovato-ellipticis obtusis crenulatis coriaceis nitidis glabris basi rotundatis brevissime petiolatis (subtus papilloso-glanduliferis), perianthiis masculis solitariis turbinatis 5—7-lobis 10—16-andris, cupulis involucriformibus lævigatis quadripartitis segmentis sublinearibus

laciniatis, ovariis lateraliter exsertis triquetris angulis marginatis. *Mirb. l. c. p.* 469. *t.* 6.

Hab. Straits of Magalhaens. *Commerson.* South part of Terra del Fuego. *C. Darwin, Esq.* (n. 521.)—The young shoots are entirely clothed with a resinous varnish, the old leaves are about an inch long, and have very obsolete reticulations especially on the under-side, where they are dotted with copious resinous papillæ, the margins are doubly serrated.

8. F. *dubia* (Mirb.); foliis ovatis obtusiusculis duplicato-serratis coriaceis nitidis glabris basi rotundatis brevissime petiolatis, perianthiis masculis solitariis turbinatis 5—7-lobis 10—16-andris, cupulis . . . . . . *Mirb. l. c. p.* 471. *t.* 7.

Hab. Straits of Magalhaens. *Commerson.*—Mirbel strongly suspects that this is only a more luxuriant state of *F. betuloides*, with smoother, more elongated branches, larger leaves, which are more scattered, oval, not elliptical, toothed, not crenulated. It was named *Betula antarctica* by Commerson in his Herbarium.

9. F. *Forsteri* (Hook.); foliis elliptico-ovatis coriaceis glabris utrinque acutiusculis grosse obtuse serratis minute reticulatis nervis primariis obsoletis. (Tab. VIII.)

Betula antarctica. "*Forst. in Comment. Goett.* IX. *p.* 45." *Willd. Sp. Pl. v.* 4. *p.* 466.

Hab. Terra del Fuego. *Forster* (in Herb. nostr.) *C. Darwin, Esq.* (*n.* 155.) Port Famine; Straits of Magalhaens. *Captain King.*

Arbor? Rami subtortuosi, breves, copiosi, rugosi, cortice fusco obtecti, juniores hinc linea pubescente. Folia numerosa, alterna, ¾ lin. longa, ovata seu elliptico-ovata, basi æquali apiceque acutiuscula, coriacea, glabra, subavenia sed venulis minute reticulatis, subtus areolis depressis, marginibus grosse obtuse sed subæqualiter serratis. Petiolus vix lineam longus, glaber, vel læviter pubescens.

I have thought it right to give a figure of this plant from Forster's specimen in my possession, believing as I do, that it is the plant intended by Forster for his *Betula antarctica.*

Fagus Forsteri.

With such imperfect individuals, however, as I possess, all of them destitute of flower and fruit, and exhibiting as is evident, some slight discrepancies in the foliage, I will not undertake to say that the *Fagus dubia*, and the *Fagus betuloides* of Mirbel, may not, together with this, constitute one and the same species.

TAB. VIII. *Fagus Forsteri*. *Fig*. 1. Leaves:—*magnified*.

10. F. *alpina* (Poep. et Endlich.); foliis ovato-lanceolatis basi rotundatis serrulatis utrinque hirtis ciliatis supra glutinosis, involucri lobis ovatis dorso margineque appendiculatis, appendicibus incisis multifidisve glandulosis. *Poep. et Endlich. l. c. p.* 69. *t.* 196.

HAB. Antuco, on the elevated mountains in South Chili. *Poeppig*.—With this species I am unacquainted.

11. F. *Cunninghamii* (Hook. supra).—(TAB. VII.)

HAB. Van Dieman's Land. (v. supra.)

IX. NOTICE OF BOTANICAL PUBLICATIONS.

1. *Illustrations of Indian Botany*, or Figures illustrative of each of the Natural Orders of Indian Plants, described in the Author's "*Prodromus Floræ Peninsulæ Indiæ Orientalis*;" with Observations on their Botanical Relations, Economical Uses and Medicinal Properties; including Descriptions of recently discovered and imperfectly known Plants: BY ROBERT WIGHT, M.D., F.L.S., &c., Surgeon on the Madras Establishment.
2. *Icones Plantarum Indiæ Orientalis*, or Figures of Indian Plants: BY ROBERT WIGHT, M.D., F.L.S., &c., Surgeon of the Madras Establishment.

SUCH are the titles of two very important works, now conducted at Madras by the zealous botanist whose name stands connected with them, and which bid fair, from the comprehensive nature of the undertaking, and its great usefulness, to form an era in the progress of Indian Botany. Rheede has given

us a *Hortus Malabaricus*, a lasting monument of the talent and assiduity of its distinguished author; Linnæus and Hermann, a volume on the Vegetation of Ceylon; Roxburgh, Wallich, and Royle, have supplied us with the most useful and most splendid works on the Botany of Hindostan, and the northern parts of the vast continent of India; Wight himself, in conjunction with his able and laborious coadjutor, Dr Arnott, with a Prodromus of the Flora of the great peninsula of India; but the present publications, although apparently in the first instance only destined to illustrate the Prodromus just mentioned, have received such powerful assistance, through the liberality of Dr Wallich, that they bid fair to embrace figures with remarks of all the Plants of the Continent of India.—To conduct such gigantic works, requires a man of no ordinary stamp. Together with an extensive and familiar acquaintance with Indian Botany, there must be combined the most persevering industry, a mind capable of intense application, not overawed by temporary difficulties, an ardent desire for the diffusion of science, a constitution not likely to be enervated by close application in a very relaxing climate; lastly, there must be at the disposal of the author an independent property to enable him to secure a publisher (if indeed publisher can be procured at all), or, as is the case hitherto, to justify the author in being his own publisher. All these rare qualities, we believe, are centred in Dr Wight. The plates are executed in lithography, and but for this happy invention in the arts, our valued friend could scarcely have ventured to grapple with such difficulties as he must have foreseen to lie in the way. But this art, although brought to such high perfection in civilized Europe, had as yet met with but few patrons in our Asiatic possessions, and some of the obstacles which have to be surmounted are already shown in the prospectus, accompanied by a specimen-plate issued by Dr Wight at Madras, October 15, 1839.

"I have now," says Dr Wight in a letter addressed to the Editor of the "*Madras Journal of Literature and Science*,"

"much pleasure in sending you a specime n ofthe work spoken of at page 74 of the last Number of your Journal. The plant figured is a new species of the Natural Order *Asclepiadeæ*, nearly the whole impression of which has been struck off from my own lithographic press. I may here observe, that I am well aware of my present imperfections in this difficult art, but, as every successive trial exhibits some improvement on the preceding one, I am encouraged to anticipate ample success, when some further practice has conferred skill in the management of the press and in the performance of the various manipulations to be gone through in the process of printing from stone, and I trust that my first number will afford satisfactory evidence of the style in which the work will be finished; thinking at the same time, that the specimen now put forth may be looked upon, all things considered, as an earnest that the work itself will be found an useful aid to Indian botanists and by no means discreditable to the state of the arts in India.

"Emboldened by this early success, it is with no ordinary feelings of satisfaction, that I contemplate the prospect which it holds out, of enabling me to carry into effect a design which ten years ago I was preparing to enter upon, the publication, namely, of a series of figures of Indian plants, under the title of '*Illustrations of Indian Botany:*' success being rendered more certain by the advantages derivable from my present official situation, as the work may be looked upon as part of the duties of my office; and, in this light, has received the sanction and approbation of the Madras Government.

"These '*Illustrations*' have been undertaken in the hope of effectually aiding the advancement of botanical science among us, and thereby extending our acquaintance with numerous curious and useful plants, the value of which is known to few, or the knowledge is confined to particular districts, though the plants themselves may be widely distributed; and in the not less cheering expectation of permanently bringing to light, under systematic denominations, many others endowed with the most valuable medicinal pro-

perties, of which I have received, from really competent observers, accounts so satisfactory, that they could not fail to produce a strong feeling of regret, that the narrators were unqualified to give me more perfect information regarding them.

"Botany has hitherto advanced with tardy steps among us, the catalogue of Indian botanists having never, at any one time comprised more than a few names: her most palmy days having undoubtedly embraced the concluding years of the last, and first quarter of the present century; during which Koenig, Roxburgh, Röttler, Klein, Heyne, and Buchanan Hamilton flourished.

"When we contemplate the impediments which these truly great men had to surmount in arriving at the eminence they justly attained in their favourite pursuit; partly originating in the imperfection of books treating of Indian plants, and partly from the engrossing duties they had to perform, the intervals of which, only, they could devote to botany, we cannot too much admire their perseverance and devotion to science; while they afford a striking example of how much may be done by a skilful division of our time, and a careful appropriation of our leisure to scientific pursuits.

"While we thus admire their industry in obtaining knowledge, we equally regret that, with the exception of the illustrious Roxburgh, leisure sufficient was not granted to any one of them to leave a comprehensive written record of the extent of his acquirements, for the benefit of succeeding labourers in the same field: hence, we are constrained to acquire much of our knowledge of Indian plants, in the same round-about way that they did, that is, from general systems of Botany (greatly enriched by them, certainly), in place of local Floras.

"These systems, embracing as they do the vegetation of the whole globe, are necessarily very concise, and the species so briefly described, as not seldom to render it next to impossible to identify the plant from its specific character. One object of the present work is to remedy, in some degree, this

defect, which even the most carefully-drawn characters cannot always avoid, owing to the inadequacy of language to find terms sufficiently precise for the designation of the innumerable forms which the vegetable kingdom presents, and especially for distinguishing the varying forms which the same plant, when produced under circumstances tending to increase or diminish its luxuriance, is apt to exhibit.

"The insufficiency of language alone, to convey just ideas of the forms of natural objects, has led naturalists, ever since the invention of engraving, to have recourse to pictorial delineation, to assist the mind through the medium of the senses, and, prior to the time of Linnæus, not without good cause, since nothing could be more vague than the language then employed in description. Thus the number of figures published by the older writers, is truly astonishing. The precision of modern scientific language, the generalization of the innumerable objects of natural history into classes, orders, tribes, and families, and the accuracy and minute details which the representations of recent artists present, have fortunately all combined to diminish the necessity for the innumerable figures of the older naturalists, the latter cause having increased their cost so greatly, as materially to diminish their production even to the extent required for the elucidation of the rapid advances natural history is now making.

"The vegetable treasures of India have undoubtedly been highly honoured by the magnificence of the works dedicated to their illustration, as those of Rheede, Roxburgh, and Wallich, amply testify; but, unhappily for science, the first of these is very rare, and they are all so costly, that few can afford to purchase them, while, from their size, they can only be conveniently consulted in the library. In spite, however, of these drawbacks to their more general use, they have been of immense service to Indian Botany, and are alike creditable to their authors and to the countries which produced them, while the value of the last is vastly enhanced, by several very admirable memoirs on different Natural Orders by some of the most distinguished living botanists.

"The work which I am preparing to enter upon, is of a humbler, but I hope not less useful, description; its object being to furnish, at the cheapest possible rate, a series of accurate figures of plants, with copious analyses of the parts of fructification, so as, in the words of a highly talented correspondent, (the author of the 'Tabular view of the generic characters of Roxburgh's Flora Indica,)' to supply the Indian botanical amateur with the 'one thing needful,' towards acquiring a correct knowledge of the principles of the natural method of classification, by presenting him with a series of diagrams, if I may so call them, which he can compare, point by point, with the written characters of the Natural Orders, selecting for illustration as often as circumstances will permit, such plants as are valued on account of their useful properties.

"In inviting public support to an undertaking of a kind so novel in Madras, it is necessary to give some information regarding the plan and price of the work, though neither can as yet be said to be definitively determined upon. Several plans have suggested themselves, but the following seems to merit the preference.

"The quarto size will be adopted, as affording more room for analysis, and freer scope to the artist in making the drawings, a very considerable number of which are already prepared. The figures are to be coloured, and on each, in addition to the name of the order and plant figured, it is proposed to write the *Tamul* and *Teloogoo*, and occasionally other names, in both native and Roman characters; and, lastly, each plate, in addition to its own number, will have the general number of the species in my 'Prodromus,' if the plant is already described there, to facilitate reference, and after-arrangement, should that become necessary. The letter-press, in place of consisting of simple descriptions (as is usual in such works) of the plants figured, and which can be little else than repetitions of the characters already published in the Flora, will, with the view of rendering this portion of the work more generally useful and agreeable to both the botani-

cal and general reader, be devoted to remarks illustrative of structural peculiarities; the valuable properties which predominate, either in the individual figured, or in the Order to which it belongs; the methods adpoted for procuring these, and peculiarities of culture, where such are required in their production.

"In extent, it is not expected to exceed three hundred plates (but may possibly fall short of that number), to be published at the rate of about one hundred annually, in numbers, commencing in January, 1838, or so soon as the names of one hundred subscribers are received; and continued, either monthly or every alternate month, as may be found most generally convenient and economical. The estimated expense to subscribers will not exceed thirty rupees, per volume of one hundred plates; one half of which is the cost of colouring alone, the remainder being charged for the letterpress (which will be copious), lithography, paper, drawing, &c., and at this price it is nearly fifty per cent. under the English price of similar works.

"This low price is effected by charging little more than the actual outlay; it forming no part of my plan to reap personal profit from a work, the conducting of which I look upon as part of my present official duties. In England, authors of such works contract with a publisher, possessed of the means of continuing the publication until the probability of remuneration is ascertained; and who, to remunerate himself for the risk and sacrifice of capital at the outset, charges a profit of from 30 to 40 per cent. on the cost, while he enjoys every facility which former experience, and the advanced state of the arts in Europe, give, to ensure the work being got up in the best style and at the lowest charge. In Madras, the case is totally different: this is the first publication of the kind ever attempted here; we are, therefore, without experience, have no practised publishers, no colourists; we find it even very difficult to procure colours, and must depend on the chance of the market for our supplies of paper, in place of ordering it direct from the maker, of what-

ever size, quality and price might appear most suitable; here, in short, every thing must be done for the first time. I mention these incidental sources of disappointment in anticipation, lest imperfections should occur at the outset which might be unavoidable in Madras, but which, in more favourable circumstances, would justly merit censure."

Of the "Illustrations," thus courageously begun in 1838 with coloured lithographic plates, eight numbers are now before us, and they are most highly creditable to Dr Wight and the artist whom he has employed. We do not look for the high finish, nor brilliant colouring which characterizes modern European botanical plates: but we find what is of infinitely more consequence, copious analyses of the parts of fructification, drawn, as are the entire figures, by a talented native artist, (Rungia,) who has long been employed by Dr Wight, under his immediate inspection. The botanical remarks are full and carefully executed, the observations on the properties and uses of plants are also numerous and satisfactory, and so important, that we do not wonder the liberal and enlightened body of men who compose the local government, should extend their patronage and support to the work. We consequently find the Madras Government heading the subscription list for fifty copies. Ninety-two other names follow as subscribers from the first No. Previous to the completion of the 8th No., 118 more subscribers had come forward, and these we believe all in India; so that we confidently expect that the meritorious author will not only be relieved from all pecuniary loss, but that he will have the satisfaction of knowing that his labours have been duly appreciated by those who take an interest in the rich and varied vegetation of our Indian possessions.

The arrangement followed in this work, is precisely the same as that of the "Prodromus." As a specimen of its nature, we may briefly mention the following as the contents of the first No. The whole is given in the English language.—ORD. I. RANUNCULACEÆ. 1. A full character of the Order is given. 2. Remarks on its botanical affinities.

3. The essential character. 4. Observations on the geographical distribution. 5. Properties and uses, under which the celebrated Bish or Bikh of the Nepalese (*Aconitum ferox*, Wall.) is particularly noticed, as ranking among the most virulent of vegetable poisons. 6. General observations, followed by remarks on certain genera and species.—In the same way are also characterized the DILLENIACEÆ and the MAGNOLIACEÆ. The plates represent, 1. Clematis Munroana, *R.W.*, and 2. Ranunculus reniformis, *Wall.*, as illustrative of RANUNCULACEÆ. 3. Acrotrema Arnottianum, *R. W.*, and Schumacheria castaneæfolia, *Wall.* (DILLENIACEÆ.) 5. Michelia Pulneyensis, *R.W.* (MAGNOLIACEÆ.) 6. Uvaria Narum, (ANONACEÆ.) 7. Cocculus macrocarpus, (MENISPERMACEÆ.) and 8. Berberis tinctoria, *Lesch.*, (BERBERIDEÆ.) In the 4th No., the Order MALVACEÆ, to which the Cotton belongs, includes a long dissertation on that important article of commerce, and figures of four kinds are given. The subject of the cultivation of Cotton in India is amply treated of, and reasons are adduced for the want of success which has so generally been experienced. "Could," thus Dr Wight asks, "could any thing be done to improve the quality and marketable value of Indian Cotton? To me," he continues, "it appears that much might be done towards the attainment of this object. According to the system usually pursued in native husbandry, the soil is rarely, if ever manured, is but indifferently ploughed, the seeds are never changed, but the produce from the same stock is constantly resown, and that too usually broad-cast, so thick that the plants choke each other in their growth; the young shoots are never topped; in short, nothing is adopted having a tendency to improve the quality, or increase the quantity of the produce by invigorating the plant, while the land is still farther exhausted and the plants yet more choked, by crops of other grain being taken off, while the Cotton is advancing to maturity. When the crop is at length ready to be gathered, no care is used in the collecting to keep it clean and free from dry and broken leaves, and what is much worse, when

a great demand for the article exists, the Ryots have even been known to pull the green pods and ripen them in the sun, in place of allowing them to become mature and open on the stalk; much to the injury of the good name of Indian Cotton, more especially of that from Tinnevelly, which used to be in high esteem, but has, I am told, recently fallen into disrepute, owing to that cheat having been practised in 1833–34. Ought we not then to endeavour to the utmost, to elevate the culture of the indigenous Cotton, and, by ascertaining its intrinsic value and cost of production, determine by comparative returns, the respective value to the country of the two kinds? It may be found that our cottons make a better return to the country at 6*d.*, than the American ones do at 8*d.* per pound; owing to the much smaller cost of cultivation and larger amount of produce from the same extent of land.

"These, however, are points which I am certain will never be ascertained, while the culture is left entirely in the hands of the natives, as they have not the means of securing a regular succession of new seed, nor of bestowing extra expense on the tillage and gathering in of the crop; neither have they the intelligence or means of going in search of better markets, supposing them to have bestowed the requisite care to improve the produce; but must sell it on the spot, possibly at a rate scarcely higher than their neighbours get for an article of very inferior value, thus incurring a loss in place of a gain, for the extra labour and care devoted to its production.

"In thus urging greater attention to our native produce, I am far from wishing to discourage the growth of the exotic kinds. On the contrary, I feel quite convinced that the country would derive immense advantage from their more general culture, on the simple principle of their enabling us to bring extensive tracts of country under cultivation, that now are either waste or of comparatively little value, since, on such the American Cottons can be grown, while the Indian would altogether fail, the latter requiring a soil both rich and retentive of moisture for the attainment of its highest degree

of perfection. Another, and in native practice not the least important, recommendation of the American short-stapled Cottons, is the rapidity with which they mature their first crop, (the time required being even less than that for our native Cotton,) and their larger produce of wool in proportion to the quantity of seed. On the other hand, however, the seeds are considered less wholesome for feeding cattle; and should such be generally found to be the case, it will prove a very heavy drawback, if not an almost insurmountable obstacle, to its general introduction as an article of native agriculture."

The DIPTEROCARPEÆ are almost exclusively of Indian origin; we have the following interesting account at p. 86, of their properties and uses. "These are various and important. Almost every species of the Order abounds in balsamic resinous juice, in very general use in every part of India, and well known to Europeans under the common English names of *Dammer*, and *Wood oil*, according as it hardens or remains fluid on exposure to the air. That kind which is drawn from the *Shoreas* or *Vaticas*, and *Vaterias*, hardens, and forms *Dammer* and *Piney*; that from *Dipterocarpi* retains its fluidity, and constitutes the *Wood oil* of the bazaars. Some of the species produce a fragrant resin, which is burnt in the temples as incense. *Dammer* is used in India for most of the purposes to which pitch and rosin are applied in Europe. *Wood oil*, either alone, or thickened with *dammer*, supplies a common, but useful varnish for wood, possessing the valuable property of, for a long time, repelling the attacks of the white ants, as well as resisting the influence of the climate. The *Camphor-tree* of Sumatra is a species of *Vatica* (*Shorea camphorifera*, Roxb.) and produces the finest Camphor. A variety of other trees are said to afford this curious substance; but none are equal to this, either in quality or quantity. The *Vateria Indica* (*Chloroxylon Dupada* of Buchanan and Ainslie, and *Pinne Marum* of the Hindoos) yields a resin, resembling *Copal*, much finer than that obtained from the other species native of India, the finer specimens of which

are as transparent as amber, and nearly colourless. It is procured by the very simple process of cutting a notch in the tree, sloping inwards and downwards. This is soon filled with the juice, which in a short time indurates by exposure to the air. When used as a varnish, the common practice is to apply the balsam before it has become hard; but when that is not procurable, the resin, melted by a slow heat, and mixed with boiling linseed oil, forms a varnish which answers for most purposes. In addition to these more common applications of *Piney*, it is, on the Malabar coast, made into candles, which diffuse, in burning, an agreeable fragrance, give a fine clear light, with little smoke, and consume the wick, so as not to require snuffing. For making them, the fluid resin may either be run into moulds, or when yet soft and pliable in course of hardening, be rolled into the required shape. Some of these candles that were sent home, were much esteemed, and sold for very high prices, but the protective duties on made candles, imported into Britain, are so great, as to amount to a prohibition, and put a stop to this trade. The crude *Piney* is however still sent, for the purpose of being manufactured at home."

"The medicinal properties of Camphor are too well appreciated, to require notice here, while those of *Dammer* are as yet but little known. The late Dr Herklots directed attention to a native remedy for *Berriberri*, *Chloroxylon*, black or liniment, the basis of which is *Dammer*, and gave a formula for its preparation which has been published by Mr Malcolmson, (page 328 of his essay on *Berriberri*.) Both these gentlemen recommend it as a useful auxiliary in the treatment of this most fatal disease. Of its merits, I am unable to speak from personal knowledge, as I have never witnessed its use. Nor indeed have I ever seen the medicine; but Mr Malcolmson seems to think it preferable to the liniments in general adopted amongst us, for most cases requiring that kind of stimulus. As nearly all the plants belonging to this Order are trees among the most majestic of the forest, they are esteemed for their timber, as well as for their resinous

juice, and the well known *Saul* (*Shorea robusta*, Roxb.) is considered by that eminent naturalist, as only second to Teak, for most purposes requiring a strong durable wood. As ornamental trees, they merit much attention, not only on account of their majestic size and handsome forms, but equally for the beauty of their clustered flowers, and the richly coloured wings of their curious fruit."

In connexion with the TERNSTRŒMIACEÆ, (to which belong the favourite *Camellias*, and the *Thea*,) Dr Wight observes, "The geographical distribution of the Order in India, both generally and individually, as regards particular genera and species, has recently attracted much attention, with reference to the extension of the cultivation of the *Tea Plant*, it having hitherto been supposed that it would not thrive, at least to such a degree as to render its growth an object of commercial importance, beyond the limits of those districts in China, whence the produce has been so long and so largely exported." And he goes on to speak of the capabilities of India for the production of this plant. "Mr Royle," he observes, "in a very elaborate article on the subject, in his *Illustrations of the Botany of the Himalayan Mountains*, comes to the conclusion, that the *Tea plant* is virtually a native of a temperate climate, and that the slopes of these mountains afford the most proper atmosphere and soil for the growth and culture of this plant—the former, as partaking of the character of the tropics during one half of the year, and of the temperate zone the remainder; the latter as being formed from the detritus of primitive rocks. In arriving at this conclusion, which is nearly in accordance with the opinion advanced by Dr Abel, whom he seems to consider, beyond all comparison, as the best authority, Mr Royle has evidently been misled by reposing too great confidence in his guide; since, strange to say, the inference is at variance with nearly the whole of the evidence advanced by himself in support of it. Were the case really such as he puts it, the south of Europe would afford nearly every requisite for the successful cultivation of *Tea*, but I greatly fear, if ever put to the test of experiment, that some of the

principal requisites will be found wanting. His views are, however, so well supported, and the contradictory evidence on which they are made to rest, so ingeniously explained away, that much difficulty must have been experienced in detecting his errors, had not careful and actual examination of the circumstances under which the plant is procured in its native country, enabled the Deputation of the *Tea Committee*, who went to examine the spots, to point out the very erroneous nature of the opinions advocated by Dr Abel, which Mr Royle had adopted and supported with such a fruitless expenditure of ingenious reasoning. From the investigations of the Deputation, it appears that so far from the *Tea* being a plant seeking the cool climate, clear sky, and dry soil, afforded by the combined operation of elevation, free exposure to light, and the rapid drainage of alpine soils, that the very opposite of all these are the circumstances in which, in its native country, it seems to delight. There it was found in mounds, but little elevated above inundation, but in a porous absorbent soil, under the shade of trees so dense, that the rays of the sun could scarcely penetrate, and what is still more remarkable, was confined to one side of the valley of Assam, so subject to be covered with thick mists and fogs during the cool season that it was estimated to enjoy less sunshine by 2 hours than the other, where the plant was never seen, though in the enjoyment of a clear sky, bright sunshine, and a temperature greatly reduced by the vicinity of snow-capped hills. The climate of Assam all accounts agree in representing as very humid, with a moderate range of temperature, rainy wet weather prevailing through the greater part of the year, and often dark and foggy in the intervals. Mr M'Clelland, who in company with Dr Griffith, was employed to visit and report on the Tea districts in Assam, thus writes regarding the first Tea Colony visited by the deputation near Caju. 'On entering,' he says, 'the forests, the first remarkable thing that presented itself here was the peculiar irregularity of the surface, which in places was excavated into natural trenches, and in other situations raised

into rounded accumulations at the roots and trunks of trees and clumps of bamboos, as in the annexed figure. The excavations seemed as if they had been formed artificially, and were from two to three and even four feet deep, of very irregular shapes, and seldom communicating with each other. After many conjectures, I found the size of the excavations to bear exact proportion to the size and height of the nearest adjoining trees, and that they never appeared but immediately under the shade of large branches. The cause thus appeared to be the collection of rain on the foliage of lofty trees, from which the water so collected is precipitated in heavy volumes on the loose and light soil, excavating it in the manner described.

"'The trenches are from one yard to ten in length, and generally a yard or two yards wide; and their general figures correspond with the form of the interstices between the branches above. The *Tea Plants* are most numerous along the margins of these natural excavations, as well as on the accumulations of dry soil, raised around the roots of bamboos. The soil is perfectly loose, and sinks under the feet with a certain degree of elasticity, derived from dense meshes of succulent fibres, prolonged in every direction from various roots. Its colour is light grey, perfectly dry and dusty, although the surrounding country was still wet from the effects of the rain that had fallen for several days immediately prior to our visit. Even the trenches were dry, and from their not communicating with each other, it seemed quite evident that the soil and substratum must be highly porous, and different in this respect from the structure of the surrounding surface of the country.

"'Extending examinations farther, I found the peculiar character of the soil, in regard to colour, consistency, and inequality of surface, disappear, with the *Tea Plant* itself, beyond the extent of a circular space of about 300 yards in diameter.'

"Again he says (p. 22), of another colony at Nigroo, 'surrounded by *tea plants* we ascended the mound, the soil of which is light, fine, and of a yellow colour, having no sandy character.' 'We then traced the plants along the summit of

the mound for about 50 yards, when they disappeared where the soil becomes dark. Now descending to the foot of the mound, I found the *tea plant* disappear where the soil, instead of being sandy or clayey, became rich and stiff.' Again (p. 23), at Noadwar: 'Having entered the skirts of a forest, which though not under water, was wet and slippery and in some cases deeply covered with mud, we suddenly descended from the very bed of an occasional water-course, and at first sight discovered a total change of soil and vegetation. From floundering in mud, we now stood on a light, red, dry and dusty soil, notwithstanding the rain to which it was exposed in common with every part of the country at the time.' Still speaking of the soil at Noadwar, he continues, 'the colour of the surface is dark yellowish-brown, but on being opened it appears much brighter, and on looking to the depth of three feet, it changes progressively to a deep, pure, orange-coloured sand, quite distinct from any of the other soils or subsoils in this part of the district; and in this remarkable situation, the *tea plants* are so numerous that they constitute a third part, probably, of the entire vegetation of the spot. The red soil disappears gradually within the limit occupied by the *tea plants*. I observed the level of the waters in the wells in this neighbourhood, to be about ten feet below the surface of the ground.

" 'From these examples, it will be observed, that a light, porous, yellow, or reddish soil is the kind which this plant naturally prefers, but situated in the midst of water and inundation on slightly elevated moulds, supposed by Mr M'Clelland to be themselves sometimes inundated. It will farther be noticed, that the sites always of small extent, occupied by the *tea plant*, were invariably in forests under the shade of trees, both of which circumstances ought to be well attended to, in any attempts made to extend its cultivation.'

" *Climate and exposure.* Under this head I find it most difficult to elicit precise information from the authorities before me, owing to the contradictory nature of the details, originating, not in the want of care on the part of the writers,

for they have examined the subject with much attention, but owing to the vast extent of surface over which the *tea plant* is procured, and the remote situations of the countries in which it is cultivated. It is now grown with success in Java under the equator, and is said to be raised as far north as the 40° of northern latitude; it is also cultivated on the banks of the Rio Janeiro in 22½° S. latitude. In Siam and Cochin China, between the 10th and 16th parallels of N. latitude, it is produced in considerable quantity; while in China, judging from the enormous quantities exported, and the still greater consumed in that empire, it is clear it must occupy most extensive tracks of the country, and be subject to very great varieties of climate, both as relates to temperature and humidity, which in my opinion, goes far to prove that it may be cultivated with success in almost any tropical climate, combining humidity with a moderate range of temperature. It is true we are told that unless the climate partakes more of the temperate than tropical character, that the tea produced will be deficient in some of its most esteemed qualities, the fine aroma, &c., but these I suspect it owes rather to soil and skilful preparation of the leaves when gathered, than to the character of the climate under which they have been produced. Peculiarities of soil in which plants are reared exert much influence on the qualities and products of vegetation; some plants growing in a very humid or marshy soil are intensely acrid, the common garden celery for example, but which when raised on a rich dry soil, becomes mild and esculent. Other plants present the opposite phenomenon, that of losing their acrid or aromatic properties when removed from a dry to a wet situation. To quote examples of the effect of soil in modifying the qualities of vegetable products, would be but to waste time; as every one's experience and reading must have furnished him with cases in point, and that too under circumstances in all other respects the same. In like manner, there is every reason to believe that the different qualities of *Tea* are owing, not so much to difference of climate, as of soil, to the sickly or vigorous condition of the plant

when the foliage is gathered, and the more or less perfect course of preparation to which it has been subjected.

The only parts of the Indian peninsula, so far as I am aware, which seem in any degree fitted for the profitable culture of this shrub, are some portions of Mysore and Malabar; especially the mountain-valleys of the latter, which partake of the proverbial humidity of the climate, combined with such an abundance of forests as would at once suffice by their density to afford shade against too much light, shelter against cold blighting winds, and finally preserve an equable and humid atmosphere over the plants at all seasons of the year. Whether such a union of favourable circumstances can be found, in combination with the peculiar light porous soil which this shrub affects in its native country, is not easy to say; but in a country enjoying a range of temperature, rarely, if ever exceeding 85°, or falling below 60°, with extreme humidity, and abundance of forests to supply shade from the sun and shelter from the winds, there seem to exist so many chances of success, that I would strongly urge the propriety of having the attempt made. Mr Huxham, a not less active and enterprising than skilful planter on this coast, would, I think I may safely add though I have had no communication with him on the subject, gladly undertake the conducting of such an experiment, if supplied with plants. If my conjectures as to his willingness prove correct, I should recommend his being furnished with plants for that purpose; and if procurable, would advise them to be brought from China, as from having already been long subjected to artificial culture, such plants are likely more readily to accommodate themselves to new circumstances, than those derived from the wild stock. Once acclimated on the coast, which seems the most suitable locality for commencing the experiment, it will probably prove an easy matter to extend the culture to Mysore. On the east coast, success can scarcely be expected, on account of the extreme heat and dryness of the climate."

The AURANTIACEÆ, or *Orange-family*, as may be supposed from the great importance of their fruits, and their being

exclusively of Eastern origin, are treated a good deal in detail by Dr Wight; and no less than eighteen closely printed pages are devoted to the *Guttiferæ*, an Order as remarkable for the beauty of the trees composing it, as for the value of the timber in some (as *Calophyllum*), and the gum-resins produced by others. *Xanthochymus pictorius*, and *Garcinia pictoria*, of Roxburgh, both yield an imperfect kind of *Gamboge;* but the former of so ordinary a quality, and possessing so little of the chemical elements of that substance, that Dr Wight had been led to doubt if it could really belong to that Order, and taking into consideration the quinary (not binary as in *Guttiferæ*) arrangement of the parts of the flower, he has removed the Genus to *Hypericineæ*, and places it near *Vismia*. The plant however yielding the true *Siam* or *Chinese Gamboge* of commerce, is not known to botanists; but from a careful analysis of a gamboge of Ceylon, the produce of the *Hebradendron cambogioides* of Graham, (as given by Dr Christison, in *Hooker's Comp.* to the *Bot. Mag. vol.* II. *p.* 193. *tab.* XXVII.) there can scarcely be a doubt but it belongs to some plant of this natural family. This valuable memoir on the *Guttiferæ* is terminated by a Synopsis of all the known Indian species, with copious observations, especially relating to the Genus *Hebradendron*, which shows what close attention our author has paid to this interesting group of plants. This article closes the eighth and last part that has yet reached Europe of this very excellent work.

A few words require to be said on the second of the publications above alluded to of Dr Wight, namely, his "*Icones Plantarum Indiæ Orientalis*, or figures of Indian Plants." Scarcely had the first No. of this indefatigable and patriotic author's "Illustrations" appeared, than he became sensible that the number of plates which the plan of that work admitted, was inadequate to the attainment of one of its principal objects, namely, the full elucidation of the distinctive characters of the Natural Orders, as explained in the descriptive portion of the work. "For instance," he observes, "in the description of *Capparideæ*, where several examples are

quoted in support of particular statements, such as *Cababa, Gynandropsis, Polanisia*, &c., not one of which, although all common plants, may be known to the majority of readers, the 'Illustrations' alone can afford but little assistance towards acquiring a correct knowledge of the peculiarities they are intended to explain: this information I am desirous of communicating through the aid of additional figures. Again, when treating of the 'Properties and Uses of Plants,' many are mentioned as meriting attention on those accounts, but of whose forms the name communicates no definite idea. —For want of figures, Dr Ainslie's '*Materia Medica of Hindostan*,' the compilation of which cost him nearly twenty years of incessant application and research, remains to this day little better than a monument of abortive labour, so few persons, of the many in this country who consult it, possessing sufficient acquaintance with the plants named to be able to recognise them even when laid before them, and fewer still to go in search of them when wanted. Hence, of nearly five hundred species of plants included in that work, as used for medicine, food, or in the arts, scarcely one-tenth is known to Europeans, and perhaps not more than a third to natives generally; and, of the latter, unbotanical readers have no other means of acquiring a knowledge than through the oral communications of natives, whose acquaintance with the plants indicated, being entirely traditional, without any guide to direct them always to the same plant, is as likely to be wrong as right." To supply, then, an accurate book of reference, containing correct delineations of all useful plants, so as to establish the native names on a correct basis, is another and not the least important purpose of these figures.—"The grand object of this work," Dr Wight concludes in his *Prospectus*, (from which we have been quoting,) "may be summed up in a few words; viz., to give to India (so far as the limited resources of a private individual will permit), that which England has so long enjoyed in '*Smith's English Botany*,' a *standard botanical book of reference*, by the publication of correct figures of as many Indian Plants as I possibly can, and in the short-

est period of time, to which may be added, at the smallest possible cost." These 4to. plates are offered at the low price of ten for a rupee. It is no small merit of this work, that the labour of printing the greater proportion of these plates has been undertaken by Dr Wight himself. These plates are really excellent; especially those of the later numbers. No 5 is the last which we have received. Pages of letter-press are now and then given, explanatory of the figures printed on one side of a leaf, so that they may be cut out and fastened to the plates to which they belong, for greater convenience of reference. We heartily wish Dr Wight health and long life, and such abundant success as that he may see his important labours brought to a satisfactory conclusion.

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3. *Iter Hispaniense;* or a Synopsis of Plants collected in the Southern Provinces of Spain and in Portugal, with Geographical Remarks and Observations on rare and undescribed Species; by PHILIP BARKER WEBB. Paris & London.

4. *Otia Hispanica;* seu delectus Plantarum rariorum aut nondum rite notarum per Hispanias sponte nascentium, auctore PHILIPPO BARKER WEBB. Pentas I. Paris et London.

IN the first volume of our *Companion to the Botanical Magazine*, we took occasion to notice the commencement of Mr Webb's admirable "*Histoire Naturelle des Iles Canaries*," which he publishes in conjunction with M. Berthelot. That work is rapidly progressing, and it has reached the 45th Livraison. The beautiful atlas on the *Geographie Botanique*, is completed, and we believe four more Livraisons will bring this splendid and useful book to a conclusion, a book worthy of ranking with the most philosophical and most scientific publications of the age; and of which the plates, whether representing the scenery, the costume or the

varied objects of Natural History, are beyond all praise. We trust to recur again to this work when it shall be concluded. In the meanwhile we gladly direct the attention of our readers to two Botanical Treatises written by the distinguished naturalist and elegant scholar, Mr Webb, on the Plants of the southern provinces of Spain and of Portugal. The nature of the *Iter Hispaniense* is best explained by the following extracts from the preface:—

"Ten years," says Mr Webb, "have elapsed since embarking from Belem at the mouth of the Tagus, for the island of Madeira, I took leave of the Spanish peninsula. During two years, from the spring of 1826, to the 6th of May, 1828, I had examined more or less the whole of that fertile region, which extends along the shores of the Mediterranean, from the foot of the Pyrenées to the mouth of the Guadalquivir; the neighbouring coast of Africa, from the mountains around Tetuan to the south of Cape Spartel; and the greater part of Portugal, from Braga in the north, to the chains of Cintra and Arrabida in the south. Two years afterwards, on my return from the Canaries, in company with M. Berthelot, I again saw Gibraltar and its environs, whence we sailed to the low islet of Alboran, beyond the mid channel of the Mediterranean betwixt Spain and Barbary. From thence, the wind not permitting us to make Melilla, we left behind, not without regret, the lofty mountains of the province of El Rif, in Morocco, and cast anchor amongst the three islands now called the Zapharines. From thence we finally touched at Oran and Algiers, disturbed at that time both by their recent conquests, and the political dissensions of the conquerors, and altogether unfitted for our peaceful pursuits.

"Such was the course of a journey, too short if measured by the space explored, and too quickly accomplished, if regard be had to the interest attached to the localities. Turned always towards the south, I did not stop till I reached Madeira and the Canaries, hastily collecting on the way such objects as the season offered. Much therefore is left undone in these rich fields of Flora, in which, notwithstanding the gleanings

of learned men, from Clusius to Bory de Saint Vincent, the labourers have been too few for the abundance of the harvest. Since then, M. Rambur, a zealous Zoologist, and author of a Fauna of Andalusia, has brought with him from the same country a valuable collection of plants; a part of which, owing to his kindness and that of M. Decaisne, I have been enabled to examine. M. Edmond Boissier of Geneva, last of all, in 1837, has carefully explored the whole kingdom of Grenada; and the botanical world will in a short time profit by the results of his interesting investigations, concerning which a short notice has already appeared in the *Bibliothêque Universelle* of Geneva, and the *Compositæ* in the Prodromus of Professor de Candolle.

"Other pursuits and various accessory causes have retarded the study of my Spanish herbarium, and it was only towards the end of 1837, that I began to select from it the species which appeared altogether undescribed, and such as seemed to need further illustration. The drawings and plates of many of them are already finished, but as this is a work of much outlay both of money and time, I have followed the example of many esteemed authors, and anticipated its publication by a Prodromus or Synopsis of its contents. Such has been the origin and intention of this little tract; in executing it, I have added to it a list of such species as though long known in other regions, were unlooked-for denizens of the Spanish soil; and others, concerning which it seemed desirable to have confirmed accounts, or precise localities. I have passed over most of those species which are common everywhere on the borders of the Mediterranean, and many more which the imperfect nature of the specimens renders it difficult to decide upon; nor have I named Portuguese plants, when already cited by Brotero, except for some special purpose either of elucidating rarer species, or of recording new stations. This little catalogue thus composed will perhaps not be useless as tending to illustrate the vegetable geography of the northern hemisphere. On this account, I have frequently insisted in the notes on the affinities, which have been

rarely attended to, of the distribution of species at the two extremities of the Mediterranean under the same latitude, and this not in herbs and annuals which migrate easily, but in permanent or arborescent species, and in mountain vegetation. The Canarian Flora first drew my attention to this subject. Our knowledge likewise of the vegetation of southern Europe, which has been the object of too many isolated labours, is obstructed by a mass of puzzling synonyms. As far as time and circumstances will permit, I have striven to clear away some of this accumulation of Augean rubbish; and where I shall be found to have erred, the cause of error will have doubtless proceeded rather from the wish to unite the same forms, than from any desire to create new names. Let us hope that this and similar works may at length awaken the Spanish botanists from that ὕπνον λήθαργον βαθὺν, in which they have too long indulged. It is to them alone that we must look for a complete catalogue of the richest and most varied Flora of Europe, for as Pliny truly says, after Italy the garden of the world, 'exceptis Indiæ fabulosis, proximè quidem duxerim Hispanium quàcumque ambitur mari.'"

The Oaks being trees of peculiar interest, attracted Mr Webb's particular attention, and his catalogue comprises eleven species, of which, however, one is Mauritanian. They are divided into three groups. I. QUERCUS DECIDUÆ. 1. *Q. Robur*, L., (comprehending *Q. pedunculata*, and *Q. sessiliflora*, of authors). 2. *Q. Toza*, Bosc.; the geographic range of which is much wider than is generally supposed. "I gathered it not only in Spain, plentifully, but likewise in the woods around the Bosphorus, and in the valley of Domoùz Derèh on the Black Sea. It will doubtless be met with in other intermediate points between these widely separated stations."—II. SUBDECIDUÆ. 3. *Q. humilis*, Lam. "This is altogether a south-western species. I believe the neighbourhood of Gibraltar to be its easternmost station. It entirely covers the arid tracks where it appears, reaching a height of from six inches to three feet, though I have seen at times bushes which have attained twelve or more feet. 4.

Q. Lusitanica, Lam. "It has been the fate of this remarkable tree to have been overlooked for more than two hundred years after the time of Clusius, and then to have been almost simultaneously rediscovered and described under a multitude of names by various authors. This too is the more singular as regarding a tree which produces an object of primary importance, namely, the gall-nuts of commerce. Clusius indeed remarks, 'galli autem extremis ramulis nascuntur, iisque in officinis venales reperiuntur, perquam similes,' and in fact when compared with the *Quercus infectoria*, both as originally collected by Olivier, and as found by Labillardière in Syria, and by myself and M. Parolini in Phrygia, the Spanish plant turns out to be identical with the Levant species, whose product is so universally employed. This oak begins to appear both in the eastern and western portion of the old world between the forty-first and forty-second degrees of northern latitude. It does not seem to pass the Pyrenées in the west, and I found it to the east to the north of Constantinople in the valley of Domoùz Derèh, which opens on the Black Sea. How much farther northwards in this direction I am unable to say. It descends as far south as Syria, but how far it follows in the west the chain of Mount Atlas cannot be yet ascertained. It is not indigenous in the Canaries, but as well as the chestnut trees has been introduced by the Spanish colonists."—5. *Q. Hispanica*, Lam. This is the famous oak cultivated in this country as the "Luccombe," or "Exeter" oak.—III. Ilices. 6. *Q. Suber*. 7. *Q. Ilex*, L. 8. *Q. Ballota*, Desf. "Clusius confounds this species with the *Ilex*, though the figure of his *Ilex major*, (Mar. Pl. Hisp.), evidently belongs to *Ballota*. Lamarck first mentioned a variety of this plant with entire roundish leaves such as it occurs frequently under the name of *Q. rotundifolia*. Desfontaines described the species accurately, and the name he gave it is far preferable to that of Lamarck, which refers to a peculiar form of the plant, to which alone it should remain attached. The Ballota begins to appear mixed with the other holm oaks between the forty-first and forty-second degrees of north

latitude, and continues to increase till, in the south, it is by far the most common species. It seems to make its appearance in Greece in the same latitude, and is perhaps the tree called Entanodrys and Hemeris by Theophrastus, but its eastern station seems to need further investigation; for it is not impossible that the Hemeris of Theophrastus may belong to the varieties of *Q. Robur*, mentioned as eatable by Professor Tenore (Syll. page 469). The distinctions between the *Ilex* and *Ballota*, are frequently little apparent in isolated specimens, but I observed that the peasant distinguished the two, accurately, at a distance, which I was for a long time unable to do. The leaves of *Ballota* have always a tendency to assume a round rather than an elliptic form: toothed and entire leaves are mingled on the same branch, and the down with which they are clothed is much thicker and of a different quality, the branches are stiffer, and the fruit, besides being sweet, is very long and cylindrical. It is of a much less hardy nature than the *Ilex*, which becomes a large forest tree when cultivated in England; whilst a *Ballota* which I preserved for near twenty years in a warm exposure, had scarcely reached six feet during that period."—IV. COCCIFERÆ. 9. *Q. Coccifera*, L. 10. *Q. pseudo-coccifera*, Desf. 11. *Q. Californica*, Webb. (*Q. pseudo-coccifera*, Labill. *Dec.* V. *p.* 9. *t.* 6. *f.* 1. *excl. f.* 2. *et synon. Desf.*): this is a Mauritanian species.

Under *Rhododendron Ponticium*, L., (the common species of our gardens,) the author remarks, "this species originally discovered by Tournefort in Pontus, was found likewise by Labillardière in Syria near Seyde. I have not had occasion to compare the Spanish specimens with those of the original locality, but they are certainly identical with the Syrian plant. Thus it appears that under the same latitude the plants of the eastern extremity of the Mediterranean are reproduced in the west. The Cedar of Lebanon reappearing on the mountains of El Rif in Morocco, and the oak of the east which produces the gall-nut covering the hills of Spain, are other not less striking examples; whilst the sub-

tropical species which vegetate in Arabia between the 25th and 30th degrees of north latitude, are found again in the Canaries."

For the characters of new species, remarks on genera and species, and geographical observations, we must refer to the little volume itself, which, though a brochure of only eighty pages, includes a great deal of valuable matter.

The first fasciculus of the "*Otia Hispanica*," besides a beautiful vignette title-page from the pencil of M. Berthelot, contains, on a folio size, five plates of new or little known Spanish plants, with full analyses and ample specific characters and descriptions, with remarks, in Latin. The first species is the *Holcus cæspitosus*, Boiss. 2. *Artemisia Granatensis.* 3. *Cytisus tribracteolatus*, Webb. 4. *Adenocarpus Boissieri*; and 5. *Salsola genistoides*; under which is given a "Chenopodearum Itineris Hispaniensis Revisio."—We shall hail the appearance of the continuation of this valuable and scientific work. Mr Pamplin informs us that copies are on sale at his residence, 9, Queen Street, Soho Square, London.

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5. *The British Phænogamous Plants and Ferns;* arranged on the Linnæan system, and analyzed after the method of Lamarck, with a comparative analysis of the Natural Families. By John Ralf, M.R.C.S.

This is an unpretending and very useful little manual of British Botany, where the whole of the classes, orders, genera and species of the British flowering-plants and ferns, are analyzed according to the well-known binary system of Lamarck, and yet the genera and species are preserved in their Linnæan arrangements. Mr Ralf is a well-known and very indefatigable Cornish botanist, and has not compiled his Flora by the help of books alone, but by a diligent study of plants themselves; and we heartily wish it the success it deserves. To one already versed in some degree in botany, the little volume is an admirable pocket-companion, while

making an excursion into the woods and fields and mountains of this country; and the chief objection to its more general usefulness, is the extreme brevity of the characters; so that we have not a sufficient number of marks by which to identify a given genus or species. As an example of this, we have at this moment the book lying before us at page 72, where the species of *Silene* are described; and the first division stands thus:—

SILENE.

1. { Stem very short, single-flowered. . . . *S. acaulis.*
   { Stem elongated, many-flowered. . . . . . 2. (*&c.*)

Now, there are other species of the genus, such as *S. conica*, *S. Anglica*, &c., which, in a dwarf or starved state, may be found to come under the first of these two characters; and the curious structure of the leaves of *S. acaulis*, which would at once determine that beautiful plant, is entirely omitted. Nor has this difficulty been lost sight of by the able author, who thus explains the mode of employing his little book:— "The student," he says, "having acquainted himself with its class and order, must carefully compare the plant with the contrasted character in each paragraph, whilst he is referred from one number to another, till he has detected its genus. Next, turning to the genus, he will pursue his way, through the numbered paragraphs, till he arrives at the species. He must now take up a Flora, and on referring to the full description both of genus and species, he will not fail to discover whether his conjecture be right, or whether he be at fault. In the latter case he must, of course, retrace his steps with more caution; but, after a little experience, his difficulties will become fewer, and his chance of success will be raised almost to certainty."

Two appendices are added to the volume; the one a brief analysis of the classes, orders, and families of the *natural system*, with references to the more extended tables of the Linnæan which precede it; and, secondly, a glossary of the technicalities used in the larger analysis. The author concludes his preface by "commending his analysis to the

patronage of his fellow-students in this delightful science, which, to those who cultivate it, furnishes at once a recreation both healthful and innocent, and an instructive and not unuseful occupation. He speaks with some confidence of these its invaluable qualities, and he does so with gratitude to the Author of Nature, who has permitted him to contemplate Him in his works, and to perceive order as well as beauty in one of the fairest portions of His creation, and therewith to solace and to cheer those hours which otherwise might have brought to an invalid only uneasiness and heaviness of spirit, during long years of necessary separation from his family and home."

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6. *Primitiæ Floræ Sarnicæ;* or an Outline of the Flora of the Channel Islands of Jersey, Guernsey, Alderney, and Serk: containing a Catalogue of the Plants indigenous to the islands, with occasional observations upon their distinctive characters, affinities, and nomenclature. By Charles C. Babington, M.A., F.L.S., F.G.S., &c., &c.

7. *Supplement to the Flora Bathoniensis.* By Charles C. Babington, &c. &c.

Mr Babington has been long known as a most diligent investigator of British plants, and as an acute observer of specific differences. To the "*Flora Bathoniensis,*" published some years ago, the author has now added a supplement; and he has rendered much greater service to the cause of British Botany by his researches in the Channel islands, a group, the vegetable productions of which had previously engaged very little attention, "probably," as Mr Babington observes, "because of their situation. Being connected geographically with France, and politically with England, the natural history of these islands has been neglected by the scientific men of both countries;—those of the former not looking upon them as part of France, and the latter rightly (?) considering them as beyond the natural boundaries of

the British isles." We must confess that we can by no means assent to Mr Babington's views of these islands being beyond the pale of the British Flora; we know not what can bring countries or islands within such boundaries, if political possession and continuity of property do not—British islands in the English channel:—together with the fact stated above by Mr Babington himself, that "the scientific men of France do not look upon them as part of that country." And surely if the vegetation of Greenland and Iceland, which countries *geographically* belong to America, be included in the *Flora Danica*, well may that of the islands in question be comprised in a Flora of Great Britain, without offence to any power. We are not on that account, however, the less grateful to Mr Babington for so meritoriously devoting his time and his talents to the formation of this interesting manual. Catalogues of plants are never prepared with so much accuracy as when detailed, by competent authors, in *local* Floras, and it is a great pleasure to us to see the number of these so greatly increase. But even, geographically speaking, if the species found in the Channel islands be considered which are common to England, the affinity is very striking. Of the 848 species of flowering plants and ferns found in Jersey and Guernsey, "the following only are not included in British Floras (as English), although several of them are now found to be not uncommon natives of England."

"Ranunculus ophioglossoides.
Erucastrum incanum.
Sinapis Cheiranthus, (sands near Penard Castle, Swansea, *Mr Joseph Woods.*)
Polygala vulgaris, β. oxyptera, (Sussex, *Mr Borrer*,—near Liverpool, *C.C.B.*)
Arthrolobium ebracteatum, (Scilly isles, *Miss White.*)
Myriophyllum alterniflorum, (Shropshire, *Rev. A. Bloxam.*)
Hypericum linarifolium.
Callitriche platycarpa, (common in England.)
Centaurea Isnardi.
Hypochæris glabra, β. Balbisii, (Kent, *Mr Borrer.*)
Senecio erraticus, (Buttington, Montgomeryshire, *C.C.B.*)
Echium violaceum.
Orobanche barbata, (on ivy in many places.)
Linaria Pelesseriana.
Salvia clandestina.
Armeria plantaginea.
Atriplex rosea, (common on the British coasts.)
Atriplex deltoidea, (common near London.)

Orchis laxiflora.
Neottia æstivalis.
Allium sphærocephalum.
Potamogeton plantagineus, (common in Britain.)
Scirpus pungens.
Festuca rubra, β. sabulicola, (British coasts.)
Bromus maximus.
Bromus diandrus, β. rigidus.

Thus there would appear to be only 12 species not yet found in England, a very small number, considering the proximity of these islands to the coast of France, and their comparative remoteness from those of the mainland of Britain.

The preface contains a brief outline of what has been done by previous naturalists towards a Flora of these islands; an interesting account of their general features, climate, &c.; together with that of their geological structure, the latter from the pen of J. G. Lukis, Esq., of Guernsey.

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8. *Sketch of the Vegetation of the Swan River Colony.* By Dr Lindley.

Although forming a part of the Appendix to the first twenty-three volumes of the *Botanical Register*, this pamphlet is, we believe, to be purchased separately; and it is of too important a character to be passed by unnoticed, for here, in a brief space of only fifty-eight pages, besides short remarks on the soil and climate of that part of Australia, and lively miscellaneous notices respecting certain Orders which prevail in the Colony, such as the *Myrtaceæ*, *Leguminosæ*, *Rutaceæ*, *Lasiopetaleæ*, *Droseraceæ*, *Pittosporaceæ*, *Compositæ*, *Epacrideæ*, *Goodeniaceæ*, *Stylidiaceæ*, *Proteaceæ*, *Hæmodoraceæ*, *Orchidaceæ*, and less extensive families both of *Exogens*, and *Endogens*,—there are given specific characters of 283 new species. The groundwork of the collection here described, is a very extensive package of dried specimens sent to this country by Mr James Drummond,* who formerly

* Mr James Drummond is brother to the late Mr Thomas Drummond, whose labours in N. America and untimely death at Cuba, must be familiar to most of our readers.

had the charge of the botanic garden at Cork, (in the neighbourhood of which he discovered the *Neottia vivipara* and *Pinguicula grandiflora*, *&c.*,) and who has been long located in the Swan River Colony. This extensive herbarium, containing many duplicates, was capable of forming several sets, which Mr Bentham kindly undertook to divide, and they were purchased by a few botanists, to whom the circumstance was made known, for the benefit of Mr Drummond; and many of our readers will be glad to know that other collections are shortly expected to arrive from the same source. Nothing can exceed the beauty of a very large proportion of these plants, some idea of which may be formed by the coloured lithographic plates which accompany the Sketch now under consideration, where, on ten plates, are given eighteen species, many of them no less remarkable for their curious structure than for the brilliancy of their colour. There are likewise some excellent wood-cuts, illustrative of certain Orchidaceous plants, and one of *Loudonia*, a new genus of *Halorageæ?* This work is a most valuable contribution to our knowledge of Australian botany.

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9. *Plantas Hartwegianas*, imprimis Mexicanas, adjectis nonnullis Grahamianis, enumerat novasque describit Georgius Bentham e Societate Linnæana Londinensi.

This work, so important to the student of Mexican botany, already extends to 72 pages, and furnishes a catalogue, not only of "400 beautifully dried Mexican species, gathered by G. J. Graham, Esq., about the city of Mexico and in the mining districts of Tlalpuxahua and Real del Monte," which are in the author's possession; but what is of greater consequence, also of the valuable collections which are in the course of distribution, and which have been made, or are forming, by Mr Theodar Hartweg, now engaged by the Horticultural

Society of London as their collector in Mexico: to which are added specific characters and descriptions of the very numerous new species. A full account of this mission we believe is in the course of preparation for the Transactions of the Horticultural Society. The preface to Mr Bentham's work, being written before the arrival of a second collection, only gives us the following information:—that "Mr Hartweg, who set out for Mexico at the close of the year 1836, was commissioned to collect and transmit to the Society seeds, roots, and plants; but at the same time, he was allowed, under certain restrictions, to furnish on his own account, sets of dried specimens for those who should subscribe for them through the Society. The first remittance has now been received and distributed, with numbers attached to each specimen; and it is the object of the following pages to make known the corresponding names to the subscribers, and to be the means of publishing such genera or species as appear to be new."—"The greater portion of this first parcel (Nos. 1 to 258 inclusive,) was collected by Mr Hartweg in 1837, to the north of the town of Mexico, on his way to Zacatecas, chiefly about Guanaxato, Lagos, Aguas Calientes, and Bolanos, with, probably, a few picked up during his short stay in the neighbourhood of Vera Cruz."—While Mr Bentham's Catalogue was in the press, a second and a third collection arrived, amounting in all, we believe, (for we speak at this moment from recollection) to more than 600 species; and the list now under consideration extends to No. 517.

With that energy for which the author is remarkable in every case where he can further the cause of his favourite science, he has kept pace with the distribution, so that scarcely has a subscriber received his share of these most interesting plants, than he finds them recorded in this "*Enumeratio.*" It is true, that hitherto, prompted by a most liberal spirit, the author has gratified himself with presenting these pages to his personal friends, and wherever he thought them likely to prove useful; we trust, however, that he will comply

with the wishes of the same friends, and make them available to the public generally.

X.—*Description of* BALLIA, *a new Genus of Algæ. By the* HON. W. H. HARVEY.

[TAB. IX.]

THE interesting and singularly beautiful plant, which forms the subject of the present notice, was discovered in the year 1803, by Robert Brown, Esq., who informs me (through our mutual friend, Mr N. B. Ward,) that he first found it on the shores of the larger island of Kent's group in Bass's Straits, where it was growing, attached to the rocks, near low water mark; and that he afterwards saw it cast ashore at Port Dalrymple, Van Dieman's Land. Mr Brown has also received it from Mr Webster, Surgeon of the Chanticleer, who collected a considerable number of *Algæ* at Staten Land and Terra del Fuego, where also it is supposed he procured this plant. If Mr Brown's conjecture that Agardh's *Sphacelaria callitricha*, *Alg. Europ. t.* VI. is merely a battered and faded specimen of our plant, be correct, as there is much reason to suppose, we have still another habitat; that supposed *Sphacelaria* having been found by M. Gaudichaud (a naturalist attached to Freycinet,) in the sea near the Falkland Islands. The specimens from which our figure and description were taken, were gathered by the late Mrs Smith at Port Arthur, Van Dieman's Land, and by Mr Ronald Gunn at Circular Head in the same island, and communicated to Sir W. J. Hooker by the latter in 1838, together with an interesting collection* of the marine plants of Van Dieman's Land, which will form the subject of a future paper.

Thus it appears that our plant has a very wide geographical range in the Southern Ocean, extending at least over 12 degrees of latitude, and 145 of longitude; but when we take

* Among the new species of this collection, is a very distinct and beautiful *Champia* (*C. Tasmanica*,) a member of a genus hitherto supposed to be peculiar to the Cape of Good Hope.

Ballia Tiunonia.

into account the very slight attention hitherto paid by travellers to the Cryptogamia, but especially the Algæ, we may expect that when these tribes come to be more carefully looked after, future observers will detect it, wherever there is land, at a latitude of from 40° to 50° south; and we may, I trust, confidently look to receive it from the Southern Island of New Zealand, if not from South Shetland itself, on the return of the Antarctic expedition of Capt. Ross.

The following are its generic and specific characters. The generic name is bestowed in honour of MISS ANNE E. BALL* of Youghal, a most successful and zealous algologist, who has added numerous new species to the Irish Flora, among which is the rare *Sporochnus Cabreræ.*

BALLIA. *Harv.*

Frons rosea, lucida, rigida, diorgana; *caulis* cylindricus, cartilagineus, inarticulatus, fibrillis vestitus: ramuli cornei, articulati, distichi, pluries pinnati, pinnis oppositis. *Fructus:* massa subglobosa, fusco-rubra, in apicibus sphacelatis ramulorum majorum et minorum immersa.—Genus *Callithamnio* colore, *Sphacelariæ* substantia, fructu, habituque affine.

1. Ballia *Brunonia,* Harv. (TAB. IX.)—*Sphacelaria callitricha? Agardh Ic. Alg. Eur. t.* VI.

HAB. Ad rupes in mari Australi. Apud "Kent Islands" et ad portum "Dalrymple, V. D. Land," *Dns. R. Brown.* Apud "Staten-Land," *D. Webster.* Prope Insulas "Falkland," *D. Gaudichaud.* Ad portum "Arthur," V. D. L., *Dna. Smith.* Ad caput "Circular" dictum, *D. Gunn.*

Radix conica, unciam lata, e fibris constituta. *Caules* plurimi, 6-12 uncias longi, basi linea diametro apicem versus ad setam porcinam attenuati, teretes, inarticulati, fibrillis minutissimis, simplicibus, falcatis, vel ramosis, subpinnatis densissime vestiti, ramosissimi. *Rami* subdistichi, alterni

* Sister to Robert Ball, Esq. of Dublin, the distinguished zoologist.

vel subdichotomi, flexuosi, axillis acutis vel obtusis, erecti; *superiores* plus minusve divisi, sæpe in flabellam expansi, vel ramulos fasciculatos ex apicibus ferentes: *rami omnes* ramulis articulatis, distichis (vel raro tristichis), pluries pinnatis, creberrime obsessi. *Ramuli* (in circumscriptione) lineari-lanceolati, bi-tripinnati, pinnis pinnulisque oppositis, creberrimis; *ramuli-ultimati-pinnati* (vel *plumulæ*) quam rachide e quo oriunt multoties tenuiores, pinnulis creberrimis, contiguis, subulatis, acutis. *Pinnæ* et *pinnulæ* nunc tristichæ. *Articuli* pinnarum sesqui-longiores; pinnularum diametrum æquantes; superiores breviores: articulus singulus apice concavus, basi convexus, superior in inferiorem insertus, e cellula unica formatus, sacculam *endochromæ* includens. *Fructus: massa* subglobosa vel oblonga, fusco-rubra, in apicibus sphacelatis rachidium ramulorum majorum et minorum immersa; apex fructifera nunc elongata, nunc contracta. *Color* purpureo-roseus, pellucidus; marcescente in viridem, tandemque in albo-luteum mutatus. *Substantia* caulium cartilaginea; ramulorum tenuis, corneo-membranacea, rigida, hyalina.

It will be at once perceived, that our plant has many points in common with *Sphacelaria*, from which genus however, I venture to pronounce it, according to the present views of systematic algologists, to be abundantly distinct, and in this opinion my friends Dr Greville and Mrs Griffiths concur. Unimportant as colour confessedly is in most classes of plants, it has been found to be a very correct indicator of affinity among the Algæ, and so constant that it has been made the *basis* of arrangement in the systems of Lamouroux, Agardh, and their followers. *Sphacelaria* is a genus of the *olivaceous* series; *Ballia* belongs to the *florideous*, in which it may stand as the analogical representative of the former. But it is not merely in colour that the latter differs; the *substance* of the frond, and the *structure* of the joints, present very striking distinctive characters; and the opposite ramuli are very unusual in *Sphacelaria*. The *subs tance* of the lesser branches is of that peculiar, horny-membranous, hyaline nature, which distinguishes some tribes of zoophytes, and is found among the

Algæ in the *Siphoneæ;* that of *Sphacelaria*, though rigid, is more of the nature of the cellular tissue of other Algæ. But the *structure* of the joints presents a still more striking character; each joint is concave at its superior end, convex at its inferior, having thus a somewhat cordate figure, the convex end being inserted into the joint immediately below it, while the concave receives in like manner the one above. These joints consist of a single cellule, and contain a bag of colouring matter which is collapsed in a dried state. The ramuli do not appear to spring from these, but from accessory cellules placed at the upper end of the main cellule of the joint, and connecting it with the joint next above it.

Mr Brown suggests, that Agardh's *Sphacelaria callitricha* may be only our plant in a faded state—an opinion that I think highly probable, as the *Ballia* assumes in decay a pale green colour. The magnified portion offers some slight discrepancies, chiefly that the ramuli are less close. The joints appear to be of the same peculiar construction. In winter, the *Ballia* is frequently found entirely destitute of the jointed and pinnated ramuli, or merely clothed with their remains, and Mr Brown supposes that this annual shedding of its lesser branches may be connected with the propagation of the plant. Perhaps, the sporular mass which generally terminates the rachides of the pinnated-ramuli or *plumules*, may be retained till these are thrown off. Many other Algæ, it is well known, are deciduous in a similar manner.

Tab. IX.—Ballia Brunonia. *Fig.* 1. Plant, *nat. size;* *f.* 2, 3. portions of branches; *f.* 4. portions of the main stem; *f.* 5. jointed hairs or fibres with which the main stem is clothed:—more or less *magnified*.

XI.—BOTANICAL INFORMATION.

INTELLIGENCE RESPECTING MR GARDNER'S JOURNEYS AND COLLECTIONS.

(Were it not for the press of other valuable communications, we would gladly have devoted a considerable share in the present No. to miscellaneous botanical matter; but we must confine ourselves to giving some account of the further progress of Mr Gardner in his arduous and hitherto most eminently successful journeyings in Brazil. The "Annals of Natural History," and the earlier pages of this Journal contain an account of his progress to Oeiras, the capital of Piauhy: and the two last letters from which we made extracts, as given at pp. 33 and 37 of this volume, were dated, respectively, May 20, 1839, and July 6, 1839. Owing to the disturbed state of the country, a previous letter written from Villa de Crato, Sertao of Ceará, dated Feb. 5, 1839, (two months after that very interesting one published in the Annals of Natural History, v. 3, p. 327, from the same place), miscarried, and did not reach our hands till March of the present year (1840). From this we shall now offer some portions, in order that a continued record, however brief, of Mr Gardner's travels, may find a place in these pages.)

VILLA DE CRATO, SERTAO OF THE PROVINCE OF CEARÁ, *Feb.* 5, 1839.

"MY DEAR SIR,—About two months ago I did myself the pleasure of writing you a long letter from this place, giving you an account of my residence in it up to that period. At the same time I despatched to Aracaty, on the coast, four large boxes, containing dried specimens of 470 species of plants for you. For reasons assigned in that letter, I was compelled to send them *en masse*, and shall be under the necessity of doing the same till I reach the coast, for this is better than running short of paper on my journey to the west of Piauhy. If the division of my specimens cannot be effected, please to let me know, that I may adopt arrangements for going home to do it myself when I shall have arrived at Pará.*

* This task of dividing the specimens for the subscribers is, I trust, now generally understood, confided to Mr Wm. Pamplin, jun., 9, Queen Street, Soho, London.—ED.

"I flatter myself that the Crato collection will give you, and my other subscribers, every satisfaction, it being well preserved and the species quite different from what I have hitherto sent. I have since made another small collection of 120 species, which also contains some very good things, partly gathered here, and partly at a place called *Barra do Jardin*, about fourteen leagues farther south; and these I have forwarded by the same route as the former. A box containing living plants and a parcel of seeds for Mr Murray, and another box of my own, filled with fossil fish from the Barra do Jardin, are also sent; on the top of the latter are three large birds and two small bats, which I would thank you to take out and present to Dr W. D. H. Among the dried specimens is a quantity of the root of a small arborescent *Bignonia*, said to bear purple flowers, (but I have not seen them). I should wish that this root were sent to Dr Christison, who obligingly offered to analyze and make experiments as to the medicinal properties of any thing of the kind which I might forward to him. The tree itself is called *Toca-je*, and the root, rasped down and infused in cold water till the water becomes perceptibly tinged, is used here as a specific for all kinds of internal hæmorrhages, and especially for those from the uterus. As a self-taught medical practitioner of this place assures me that he has employed this remedy again and again in such cases with perfect success, it would be well to try its properties.

"In my last letter I told you that it was my intention to forward it and my other despatches to Pernambuco by a Portador, which I did. On his return about a fortnight ago, after an absence of forty-four days, he brought me a large packet of letters, among them yours of the 24th August, which I need not say proved most welcome and interesting, as were the six numbers of the *Annals of Natural History*. This is a most useful and excellent publication, and I have already carefully perused all the articles it contains, only regretting that so long a time must elapse before I can see

the continuation of it. It gives me much satisfaction to learn that my plants from the Rio San Francisco arrived in good order, for I had feared such might not be the case, as they were packed during the damp season, when sometimes the most sedulous care will not preserve articles from mould, and they also lay long in town before being sent off. I was not aware that Blanchet had visited the Rio San Francisco; I thought he had not gone far from Bahia; but, however this may be, sure I am that no one has ever been where I am now, nor in the country whither I am about to proceed; so that there can be no doubt that the present and future collections will be rich in novelties. I am sorry to hear of the decease of Mr Winch, one of my original subscribers; but among so large a number, it must be expected that some will fall off, and I am reluctant to lessen the number of sets which are made up, as I hope that other botanists may come forward to take them, and sooner or later, all may be disposed of. It gives me great satisfaction to know that Mr Bentham and yourself, are engaged in preparing lists of my plants, as they will thence derive a great additional interest. Mr Bentham will be the very person to undertake the *Compositæ*, and I am more than ever anxious to collect specimens of that tribe.

"It is certainly quite delightful to hear of the spirit and liberality with which His Grace the Duke of Bedford carries on his botanical pursuits. I do all in my power to contribute to his already vast collections of living plants, as indeed I am in duty bound, and only fear he may sometimes think me not so active in his behalf as I ought to be, owing to the many difficulties that lie in the way of transmitting home growing specimens. A careless ship-captain, who takes no interest in their fate, is a very inefficient guardian to such perishable treasures.

"As *Ferns* grow readily from ripe seeds, my plan is to collect seeds of all such species as seem likely to prove new or striking. As to my finances, I am well aware that my in-

come must now depend entirely on what the collections produce, and do hope to be enabled to cover my expenses, for I always endeavour not to spend one farthing beyond what is necessary for the making of proper collections.

"You were no doubt right in not sending me all the instruments I some time ago wrote to you for; the barometer would soon have been broken, travelling here is such rough work. My chief desideratum in this way is a good portable microscope, of the kind you generally use, for though I possess two excellent pocket lenses, they are not sufficient for my purpose; and I will therefore thank you to purchase me such an one as your own, whenever you think my funds will bear the outlay, and send it to me at Pernambuco. I now proceed to detail my proceedings since I last wrote.

"On the 11th of September, a few days after I had despatched my collections to the coast, I started for the Villa de Barra do Jardin, about fourteen leagues south of this place, and separated from it by a branch of the Serra de Araripe, about ten leagues long, and running from west to east. The road skirts the base of the Serra, for about half its length, then ascends, and continues right across it to Jardin, a distance of perhaps nine leagues. The breadth of the Serra is eight leagues, and level as a bowling-green, and since no water is to be found on it, travellers have generally to carry as much as will serve during the greater part of a day. The Tabolina, as all such flats as this are called, is entirely covered with vegetation similar to what I have already described as existing on it near Villa de Crato. On my journey I found nothing new, except a *Rollinia* which I gathered on the ascent; it is a small tree, not unlike *R. longifolia*, (St Hil.) but a totally different species.

"On reaching Jardin, I received the kindest welcome from the Capt. Antonio da Cruz, who, hearing of my intended arrival, had prepared a house in the town for my reception. The country around was still more scorched than about Crato, and my collection consequently received but small additions, though I met with a few very good things, different

from what I had before seen. One is a tree about twenty feet high, with small odoriferous light yellow flowers, arranged on short axillary distichous racemes. I think it will prove to be a new genus, and even constitute the type of a new Order, intermediate between *Loranthaceæ* and *Hamamelideæ.* The enclosed description, drawn up from the living plant, you may consider worthy of publication; at all events, it will convey an accurate idea of the parts of fructification, &c.

"During my stay at Jardin, I made two other short excursions: one to a place called Macapé, five leagues east of it, and another to Mundo Nova, three leagues in a westerly direction; neither, however, was very productive in a botanical point of view. Returning from Mundo Nova, I collected a fine leafless *Viscum*, and a species of *Copaifera*, (*C. coriacea*, Martius); the latter is a noble large tree, common on the top of the Serra, and affording abundance of *Balsam;* it is called *Pao d' Olho*, by the natives. At Mundo Nova, I saw for the first time, *Chorisia crispiflora*, but like all the other trees there, it was both out of flower and fruit. It attains a height of thirty to forty feet, with a wide spreading top, and a stem which near the ground does not exceed three or four feet in circumference, but bulges out towards the middle till it becomes as thick as the body of a large cow. It is called *Barriguda.* Another tree that I found here is known by the name of *Imleuzina:* its fruit when ripe is said to be delicious, but what I saw was quite green; still I have ascertained this tree, which grows to a large size, to be a species of *Spondias.*

"During my stay at Jardin, I made a pretty large collection of *Fossil Fish;* the specimens exist in water-worn limestones, along the base of the Serra de Araripe, and will no doubt prove interesting in a geological point of view as affording a clue to the discovery of the age of the rocks in this district. I have sent a small set to my kind friend Mr Bowman, along with a sketch of the geology of such parts of this province as I have visited, he having obligingly offered to make public any discoveries of the kind of which I might transmit him an account.

"On my return to Crato, I again made several excursions in its vicinity, and picked up a few more rarities; the whole of which, together with those from Jardin, amounting to 120 species, I have packed up in readiness to send them off. The rains having now set in, sufficiently to afford grass and water for the journey, I start for Oeiras the day after to-morrow, and expect to reach it in about eighteen days, as I shall make no delays on the road. There it is my intention to remain till the rains are over, probably in the month of May, and thence proceed to the mountains, to the east of the Tocantins, where I hope to botanize for three or four months at least: then I proceed to the Rio Tocantins, and descend it to Pará, which, if all is well, I shall reach before this time next year. But respecting all this, you shall learn more when I have the pleasure of writing to you from Oeiras. The plant I sent in my last collection under the name of *Œnothera Brasiliensis*, is not an *Œnothera*, but a *Jussieua*—a worse mistake this, than that of the gentleman who sent you *Parnassia palustris* for a new *Hypericum*. The pods on the top of the box belong to the *Hymenæa*, of which there are specimens in the collection.

"I have sustained a severe loss in the decease of that close and valued companion, my watch! it stopped about a month ago, and I am not physician enough to set it going again.

"G. Gardner."

The 120 species above mentioned, collected partly at Crato, and partly at Barra do Jardin, were brought by the same vessel that conveyed the letter from Pará, and are forwarded to Mr Pamplin for distribution. They will be found to occupy a hiatus in the numbers already distributed, from 1913 to 2033,* inclusive. Unfortunately, from the long detention of the boxes at Pará, the insects had commenced their work of destruction, from which all the other collections had been so peculiarly exempted; but the greater number of

* The total number actually arrived in this country is 2468.

species being hard-leaved plants, the mischief has been very limited, confined to a few *Compositæ*, and some other delicate-leaved plants; and of these, scarcely a particle of the foliage remains.

(While the present No. of our Journal is in the press, the packet from Rio has brought us a most interesting letter from Villa da Natividade, Province of Goyaz, dated Nov. 3, 1839:—from which it will be seen how steadily Mr Gardner is following up his plans, mentioned in his July letter from Oeiras, as given by us at p. 37 of this volume; and we trust, and indeed cannot doubt, that additional subscribers to these splendid collections of plants from the interior of Brazil will come forward to patronize this well-educated man of science, who in the most disinterested manner, perils his health and his life for the sole purpose of furthering the cause of that branch of natural history, to which he is so devotedly attached.)

VILLA DA NATIVIDADE, PROVINCE OF GOYAZ,
Nov. 3, 1839.

"MY DEAR SIR,—My last letter to you, together with the collections accompanying it, which were despatched from the city of Oeiras for Pernambuco, early in June last, have, I sincerely trust, long ere now reached Glasgow in the same excellent condition in which they left me. Since then I have accomplished a long journey, and got together what I consider to be by very far the most splendid collection that I have yet made in Brazil. In my last letters, I took the opportunity of informing you that, owing to the unsettled and revolutionary state of the Province of Maranham, through which my route must have laín, I was compelled to relinquish the plan for going to Pará, and that my intention was to proceed up through central Brazil to Rio de Janeiro. For the fulfilment of this determination, I left Oeiras on the 22d of July, and journeying southwards, reached, on the 20th of August, the small Villa of Paranagoa, situated at the southern extremity of the Province of Piauhy. Although the season was far advanced when I made this journey, I collected 200 species, not a few of which will prove to be new. Among them is an undescribed *Cabomba*, the floating leaves of which, like those of

C. aquatica, (Aubl.) are peltate, but are otherwise very different, in being about an inch long and not more than two lines broad. A small white-flowered *Mayaca*, which is not described in Sprengel, a *Drosera*, several curious *Eriocaulons*, two small white-flowered species of *Nymphæa*, several *Gomphias*, three *Mouririæ*, a *Buchnera*, numerous *Loranthaceæ*, *Jussieua sedoides* (H. et B.,) *Salvertia convallariodora* (St. Hil.) several *Palms*, a great many *Leguminosæ*, and not a few *Compositæ*.

"On the 29th of August, we resumed our journey, and still proceeding in a southerly direction, reached, on the 21st September, the banks of the Rio Preto, which runs through that part of the Province of Pernambuco lying between the Provinces of Piauhy and Minas Geraës. The place where we stopped is called Santa Maria. Some rather high Serras over which we passed during this journey, afforded me a beautiful collection of plants, amounting to upwards of 200 species; among them are some fine *Eriocaulons*, *Melastomaceæ*, and *Compositæ*, a *Vochysia*, and a splendid new *Qualea*, with a stem nearly 100 feet high; a species of *Diplusodon* in fruit, two of *Mouriria*, and one of *Dipterix*, which latter is a fine large tree, and when in flower forms one of the most beautiful objects I have seen in this country: a pinnate-leaved *Rhopala*, from the banks of the Rio Preto, and a splendid annual *Gentianeous* plant, which was however, nearly out of flower when I found it. The corolla is hypocrateriform, its limb of four divisions, violet-coloured, and the tube yellow; stamens four, which, together with the style, are declinate. It grows about three feet high, and is much branched, with connate leaves. Also a *Comesperma*, numerous species of *Hyptis*, a *Lecythis*, several *Malpighiaceæ*, two or three kinds of *Anthodon*, many *Loranthaceæ*, a splendid *Cyrtopodium*, springing from the stem of a large *Palm*, the flowering-stalk about four feet high, much branched, and bearing numerous orange blossoms, spotted with red, which exhale an odour of Wallflower; some fine species of *Gomphia*, a *Callisthene*, perhaps *C. fasciculata* (Mart.) &c., &c.

"For the next nine days, our journey was of the most fatiguing description, through an uninhabited country; it was also attended with much danger, owing to a tribe of Indians from the Rio Tocantins, whose hordes infest the neighbourhood of Santa Maria, where they have lately committed many serious outrages. On one occasion lately, shortly before our arrival, these brigands attacked a Fazenda in the absence of the men, burned the building, killed three women, and took away alive three children. We were, however, well armed: I carried a pair of large holster pistols, and a brace of pocket ones. Mr Walker, my assistant, was provided with a small sword, one of my men had a carabine, and another my double-barrelled gun. Happily we had no occasion to make use of our weapons. For five days we continued our route westward along the banks of the Rio Preto, and after leaving it we crossed the Chepada da Mangabeira, which is eight leagues broad, as level as the ocean, and for several leagues entirely destitute of either shrubby or arborescent vegetation. The setting of the sun, which I witnessed while crossing this dreary tract, reminded me of being out at sea. After we had passed the Chepada, the following day we entered on the Serra do Domo, and on the 29th of September reached an Indian mission of the same name. On this journey I made another splendid collection, consisting of upwards of 250 species. Among them I may mention numerous beautiful *Melastomaceæ*, one of which belongs to the curious genus *Tococa* (Aubl.); many fine *Compositæ;* of these one in particular, an herbaceous plant with yellow blossoms like a *sun-flower*, about nine inches in diameter, seems to form a new genus of the division *Galinsogea*, DC. I also found nearly twenty species of *Eriocaulon*, one of them is a splendid branched species, from three to five feet high; two or three of *Peltodon*, a few *Gentianeæ*, a *Krameria*, a new procumbent *Acanthospermum*, and some new and very curious *Hyptides*, a *Lobelia*, *Isoetes lacustris*, (Linn.), several fine *Guttiferæ*, a beautiful *Vaccinium*, about six feet high, with racemes of scarlet flowers, numerous *Leguminosæ* and *Myrtaceæ*, a lovely

new purple-blossomed *Bletia*, of which I have since found a variety with pure white flowers, and have obtained roots of both; also a pretty small-leaved and yellow-flowered *Callisthene* and a magnificent *Melocactus*, the plant of which is four or five inches in diameter, with long recurved spines, and bears fine white flowers measuring three or four inches in length, and when expanded 2½ inches across. I possess a great many plants of this *Melocactus*, which I hope to be able to preserve alive. I also found three species of *Helicteres*, and one of the beautiful and odoriferous genus *Spiranthera* of St Hilaire. It is perhaps the S. *odoratissima* of that author, as it agrees tolerably with the description in De Candolle's Prodromus, but the flowers of my plant are pure white: also a splendid species of *Norantea*, similar to the one I sent from Pernambuco, a beautiful purple-blossomed *Diplusodon*, a very handsome suffruticose *Bignonia*, about a foot high with pale yellow flowers; it grows in round clusters about a foot broad, and is common on dry upland campos; a new *Ichthyothere*, half-a-foot high, numerous and fine species of *Malpighiaceæ*, an *Eryngium*, a large yellow-flowered *Qualea*, perhaps the same as one sent from Oeiras, &c., &c. We remained among the Indians in the Aldea of Douro a fortnight. The mission was founded by the Jesuits more than a century ago, and is now fast falling into decay; it contains about 250 persons in all, by far the greater part of whom are but little removed in point of civilization from their savage brethren of the woods. During my stay here, I made considerable additions to my stock; among others I may mention two species of *Diplusodon* in fruit, a new species of the genus *Encyclia* (of Hooker), and another *Ichthyothere*, a suffruticose marsh-plant, about five feet high. A beautiful *Rubiaceous* shrub, with numerous scarlet flowers about three inches long and narrow lanceolate leaves, here attracted my particular attention; it is probably a *Portlandia*, and grows on the banks of a small stream which passes the Aldea of Douro, its roots being almost always covered with water, and its stem attaining a height of four feet. I also found a fine *Posoqueria* and a little dendroid

Sauvagesia not described in De Candolle's Prodromus, several shrubby *Hyptides*, numerous *Compositæ*, two splendid suffruticose *Apocyneous* plants, both from two to three feet high, one having broad leaves and hypocrateriform flowers of a pink colour, about two inches across, and belonging apparently to some genus near *Vinca;* the other with decussate foliage, green above and very white below, with white hypocrateriform flowers. The pink-blossomed species is peculiarly beautiful. I likewise found here two erect subshrubby *Passion-flowers*, two feet high; *Amaryllis solandræflora ?* (Lindl.,) an *Alstrœmeria*, several *Asclepiadeæ* and *Lantanas*, an *Amyris*, &c., &c.

"On the 13th of October, we left Douro, and on the 25th reached this place (Natividade) which is about thirty leagues distant from Douro in a westerly direction. Here I intend to remain for a month or two, principally to recruit my horses, which have suffered a good deal from the long journey they have made, amounting to no less than 250 leagues. The rains have also set in, and the roads, which are bad in the most civilized parts of Brazil, are a thousand times worse in the deserts by which I am now surrounded. On this latter journey I have again collected many plants, chiefly belonging to the same Genera and natural Orders as on the two former ones, mentioned above, but the species are different, as *Malpighiaceæ*, *Rubiaceæ*, *Lantanæ*, a *Qualea*, two species of *Ichthyothere*, several new *Jatrophas* and *Erythroxylons*, &c.: also a species of the tree called by the Brazilians *Mangaba*, but with much broader foliage and larger fruit than the one sent from Pernambuco, and a very fine *Cyrtopodium*, having spotted flowers and some points of agreement with C. *punctatum*, but the petals very obtuse. *Orchideæ* have not been very plentiful in this neighbourhood, still those species which I met with are fine, and I have obtained good roots of them all, which I trust will reach Europe in a living state. *Cacteæ* are scarcer still; but the *Melocactus* mentioned above, and a very beautiful crimson-flowered *Cereus* that I gathered between Oeiras and Paranagoa, are valuable acquisitions to that tribe. I regret to say, however, that several plants of

the latter, spite of all my care, have decayed, and I fear it may not be in my power to replace them.

"On the journey between Douro and this place, a load of my dried plants encountered a sad misfortune. On crossing the Rio de Peixe, the horse which was carrying two large boxes of specimens fell down, just as he was emerging from the water, and one of the boxes dropped into the river, and before we could extract it, the water filled it! It is only a botanist who can imagine what I felt, when I saw upwards of 2000 specimens completely drenched and apparently ruined for ever. My first care was to unpack them and put them into dry paper, but so many specimens were laid on every sheet, that this process had but little effect in dissipating the moisture, and it was my intention next day to unpack them all again, and spread them out in the sun. Meanwhile having emptied the box of water and dried it, the plants were deposited in it again, and for greater security the package was put upon a stronger horse, which had not however proceeded above half-a-league, when in crossing a small rivulet, I had the mortification to see the box which contained the wet plants, as well as that which had previously escaped the disaster, both plunged below the water. The unlucky animal which carried them was going first, and instead of entering at the right fording-place, he stumbled into a deep hole with a muddy bottom, and in struggling to extricate himself, flung off both the packages; and before they could be got out, they were in a worse state than the one which had suffered in the morning. If I felt much chagrined on the former occasion, you may imagine what was my distress when I saw the hard labour of many weeks, the produce of a district, previously unexplored by any botanist, thus consigned to ruin. All that could be done was to pour the water out of the boxes and resume our journey. Fortunately for my plants and me, we reached that evening a Fazenda, where the principal article manufactured was *Mandiocca flour;* and here, since it rained heavily all next day, I obtained permission to have the use of two large stoves, on which

I dried, sheet by sheet, all the plants which had been wetted. It was, however, the hardest day's work I ever encountered, for I was incessantly occupied over the heated stoves, from six o'clock in the morning, till after midnight. From having been thus promptly attended to, the specimens have not suffered nearly so much as I had feared they would do, still many of them do not look so well as at first.

"I am very glad that you advised me to make a journey into the Province of Piauhy, and feel very confident that when the results of my present labours reach you, they will gratify you also by the number of new forms that thus will be added to your herbarium. It was certainly some disappointment to me on leaving Oeiras, that the disorganized state of the country forbade my proceeding directly westward to the Tocantins; but I now see that it was on the whole fortunate that my design was thus frustrated, as the late period of the season would not have allowed me to collect half the number of species I now possess. At present, my collection amounts to rather more than 800 species, all of which have been gathered in the short space of three months and a few days. It also contains as many complete sets as any of my former ones, and instead of lessening the number of sets, I have increased them to about thirty. I ought, however, to mention, that without the active help of Mr Walker, a young Englishman, who has accompanied me as an assistant, my stock would not have been nearly so numerous as it is.

"My intention at present is not to quit the Province of Goyaz till the rains are nearly over, which will be about the month of March; and I have adopted this determination for two reasons, because of the bad roads, and also on account of the great difficulty of preserving specimens properly during the wet season. By that time I expect to have more than 1000 species, and before I reach Rio, I hope to add as many more. From this place I mean to go to Conceisão, a few days' journey to the southward, and then turn directly east to Arrayas; and so soon as the season permits, cross the Serra das Araras, and gain, in a slanting direction southwards,

the Rio San Francisco. I intend to go up this river to Sabara and Villa Rica, from which latter town I shall again do myself the pleasure of writing to you. There too I trust to find letters from you and my other friends; and as it will then, (in the end of May or beginning of June,) be more than a year since I shall have heard from Europe, I hope not to be disappointed in this expectation.* In the desert country where I now am, one hears nothing, not even the news of Brazil.

"As regards money matters, I need not tell you that a journey like this is attended with no little expense. My

* The subjoined Stanzas, penned by Mr Gardner, under the influence of those feelings which are so creditable to one far separated from home and friends, were sent along with these letters to a young correspondent in Scotland. They were never intended to meet the public eye; but we venture to insert them here, as a proof of the superior education and amiable disposition of this zealous young Naturalist.

Stanzas, written in the Interior of Brazil.

"I wander alone on a distant strand,—
But deem ye that thoughts of my father-land,
Bringing bright visions of by-gone days,
Ne'er warm my heart with their fervid rays?
That its mountains and valleys, the friends of my heart,
Can e'er from the well-spring of memory depart?
No!—all that was dear in my boyhood's time
Is dearer still in this distant clime.

"I wander alone, and often look
For the primrose bank by the rippling brook,
Which, wakened to life by vernal beams,
An emblem of youth and of beauty seems;
And I ask where the Violet and Daisy grow?
But a breeze-borne voice in whisperings low,
Swept from the north o'er southern seas
Tells me I'm far from the land of these.

"I wander alone, and I listen in vain
For the clear sweet note of the skylark's strain,
As it breaks on the ear from her home on high
At the gleam of morn in the eastern sky:

troop of horses now amounts to nine, I am on the point of purchasing other three, and before I reach Rio I expect it will be needful for me to have three or four more, as we are obliged to carry every thing with us, provisions, cooking utensils, and often even water itself. Besides the young Englishman mentioned above as having accompanied me from Crato, I have three men in my employ, and amongst us an ox scarcely lasts a month; happily a very fat one costs about four or five dollars only. The mode in which we preserve the beef is by cutting it into very thin layers, sprinkling them with a little salt, and drying them in the sun. Thus cured, the meat becomes almost as hard as a piece of deal board, and is generally cooked by roasting on a wooden spit, and eaten along with the ground root of the *Mandiocca*. It requires good teeth to masticate such food, and I am becoming very tired of it, as we do not see fresh beef above once a-month. Figure to yourself one plate of saw-dust, and another of roasted sole-leather, and you have our bill of fare for daily breakfast, dinner, and supper. My greatest comfort is a good stock of excellent tea, which I purchased before leaving Pernambuco, and which is not yet exhausted, but this again I have to drink without milk, and the sugar is about as white as peat earth. Notwithstanding all these discomforts, the people here say there is no place on earth equal to Goyaz. Poor souls! they know no better.

But wherefore list ?—when her joyous lays,
Like a lov'd one's voice, are heard always!
They breathe in the echo of bygone years
And the Past in the Present again appears.

"I wander alone, and my wandering eye
Is dimm'd with a tear as it gazes on high,
On the myriad worlds of argent hue
Spangling the dome of ethereal blue,
Or glances round on the flowery earth,
Where so much of odour and beauty has birth;
And I sigh that no friend of my bosom is nigh,
To gaze on these scenes with a kindred eye."

"*Villa da Natividade, Province of Goyaz, Brazil, Nov.* 1839."

"From Oeiras, I wrote pretty fully about my finances, and told you that I expected to receive a handsome present from the person on whom I had performed the operation of lithotomy. I have now to inform you that before I quitted that place, he gave me 250 Spanish dollars, or about £50 sterling, which I need not say came very opportunely, and enables me to reach Villa Rica with my present stock, where I trust your letters will be awaiting me, and afford me further directions. In the meanwhile, I do hope that those botanists who have hitherto kindly supported my mission, will still continue to do so, now that my collections are much more valuable, and obtained with such increased expense to me. I feel quite certain that none of these collections can be sent to Europe before I reach Rio de Janeiro, which will be about the end of July, 1840. My first business on arriving there, will be to divide the plants into sets, and forward them home with the least possible delay; and as regards myself, you may expect to see me in Scotland some time in May or June of 1841. In the commencement of that year, I intend to gather a large stock of living plants on the Organ Mountains, and elsewhere in the province of Rio, to take home in a growing state under my own eye. But you shall hear more of this hereafter."

Notwithstanding our observation above, that we should confine our "*Botanical Information*," to the notice of Mr Gardner's Travels, we must here insert that which Dr Steudel has communicated to Mr Pamplin, relative to Mr Schimper's extensive Herbarium of Abyssinian plants. "The division of the specimens is proceeding with for the subscribers as quickly as possible; yet, it may be another month from this time (May 1), before the first delivery of three hundred species, (those collected previous to the end of 1837,) can be made. Of these three hundred, one half are hitherto unknown to European botanists, and there are many entirely new Genera among them."

Mr Pamplin has received the collections of Abyssinian seeds, and has already delivered the sets to those who previously subscribed for them; but a few sets still remain in his hands, which are offered at the non-subscribers' price of £2. 7s. 6d. the hundred species; and packets of two hundred kinds can be made up, if desired. Mr Pamplin requests that if any of the original subscribers for these seeds have not yet received their respective sets for the £2. 2s. per 100 (paid in advance), they will have the goodness to apply without delay for them.—These seeds are said to be in excellent condition, in good full-sized packets, and to be peculiarly interesting. Several of them come under the denomination of "*Semina Plantarum usui œconomica in Abyssinia cultarum.*"

Mr Pamplin wishes it to be known, that some sets of Mr Gardner's Ceará and Piauhy plants are still unsold, which are open to new subscribers on the original terms of £2 the 100 species; and we may ourselves observe, that the very few remaining sets of Mr Gardner's Pernambuco and Alagoas plants (only six in all), will immediately be placed in Mr Pamplin's hands, as the agent for Mr Gardner.

XII.—*Contributions towards a Flora of South America.—Enumeration of Plants collected by* Mr Schomburgk *in British Guiana.*—By George Bentham, Esq., F.L.S., &c., &c.

[*Continued from page* 146 *of this Vol.*]

Chrysobalanaceæ.

The only character upon which Brown is disposed to place an absolute reliance, as between *Leguminosæ* and *Rosaceæ*, the relation of the odd sepal to the axis, (*Verm. Schrift. ed. Nees* IV. *p.* 56), is not an easy one to observe in *Chrysobalanaceæ*, where the pedicels are often more or less twisted, and the ultimate ramifications of the inflorescence very frequently dichotomous, with terminal flowers; in those species,

however, where I thought I could trace it satisfactorily, it has appeared to me that the fifth division of the calyx, that which subtends the larger or more perfect stamina and the carpel, is the lowest or anterior one, the fifth petal being posterior; thus agreeing in this respect with *Leguminosæ*, as they do in their irregular flowers and solitary carpel, and leaving the basilary style and erect ovules as the only positive characters by which they can be distinguished from *Leguminosæ*, and which at the same time separate them from *Rosaceæ*.

In their habit, the *Chrysobalanaceæ* approach nearer perhaps to *Quillajeæ*, among *Rosaceæ*, than to any *Leguminosæ;* for, besides the simple foliage, whenever the inflorescence is developed beyond the simple raceme with uniflorous pedicels, the ultimate ramifications at least are regularly dichotomous, each flower terminating a branch, or placed in the dichotomy. I have never seen this disposition in *Leguminosæ*, for even in those genera of that Order which have a cymose inflorescence (*Ecastaphyllum*, *Triptolomea*,) the ultimate branches of the cyme are racemose, with the flowers lateral. In the case of those *Chrysobalanaceæ* where the racemes are really simple, the habit is not very different from that of *Etaballia*, or of the simple-leaved *Crudyæ* among *Cæsalpinieæ*.

There is much confusion among botanists as to the limitation of the published genera of *Chrysobalanaceæ*, which it will be difficult to settle absolutely until more be known of their fruits. In the meantime I have endeavoured, among those genera of which I possess specimens, to draw the following characters from the flowers only.

* *Ovarium biloculare.*

1. *Parinarium*, Juss.—Calyx 5-fidus. Petala 5. Stamina fertilia 15 in orbe completo disposita, (*Neocarya*, DC.), v. 7—8 unilateralia (*Petrocarya*, DC.) Ovarii stipes calyci adnatus.

** *Ovarium uniloculare.*

2. *Chrysobalanus*, Linn.—Calyx late campanulatus, 5-fidus.

Petala 5. Stamina fertilia circa 20 unilateralia. Ovarii stipes tubo calycis brevissimo adnatus. Cymæ axillares.

3. *Moquilea*, Aubl.—Calyx late campanulatus 5-fidus. Petala 5. Stamina fertilia ultra 30 in orbe completo disposita. Ovarii stipes tubo calycis brevissimo adnatus. Racemi terminales.

4. *Couepia*, Aubl.—Calycis tubus elongatus apice obliquus, limbus 5-fidus. Petala 5. Stamina longe exserta ultra 30 in orbe completo disposita (*Eucouepia*), v. circa 20 unilateralia (*Hemicouepia*). Ovarii stipes tubo calycis longe adnatus.

5. *Grangeria*, Juss.—Calyx late campanulatus 5-fidus. Petala 5. Stamina 15 in orbe completo connata omnia fertilia v. uno alterove sterili. Ovarii stipes tubo calycis brevissimo adnatus.

6. *Hirtella*.—Calycis limbus 5-fidus. Petala 5. Stamina fertilia 3—8-(interdum 10—12?) unilateralia longe exserta. Ovarii stipes tubo calycis obconico v. elongato adnatus.

7. *Licania*.—Calyx campanulatus 4—5-dentatus v. breviter 5-fidus. Petala 0, v. 4—5, parva. Stamina fertilia infra 15. Ovarium in fundo calycis sessile.—Hujus generis sectiones sequentes forte pro tot generibus habendæ sunt.

1. *Batheogyne*.—Calyx late campanulatus. Petala 0. Stamina fertilia 10—12 unilateralia breviter exserta.

2. *Leptobalanus*.—Calyx late campanulatus. Petala 0. Stamina 10 in orbe completo disposita omnia fertilia exserta.

3. *Microdesmia*.—Calyx ovatus. Petala 5 minuta v. nulla. Stamina fertilia circa 10 unilateralia inclusa.

4. *Eulicania*.—Calyx ovatus v. subglobosus. Petala 0. Stamina fertilia 3—5 unilateralia inclusa.

5. *Hymenopus*.—Calyx ovatus v. subglobosus. Petala 4—5. Stamina inclusa altius monadelpha, fertilia 5—8 unilateralia.

The fruits of *Chrysobalanus*, *Hirtella*, and *Licania*, as far as known, are nearly the same, the pericarp thick and fleshy, but not pulpy, splitting more or less when dry into several valves from the base to about the middle. In *Chrysobalanus*, it is more fleshy and rounder; in *Hirtella*, usually obovoid or

olive-shaped; in *Licania*, narrow-obovate, oblong, clubshaped, or even linear. The fruits of *Parinarium*, and of *Couepia*, are already sufficiently described; that of *Moquilea* is unknown.—*Acioa* of Aublet appears to have many of the characters of *Couepia*, but, judging from a very indifferent specimen, has not the habit, and I have no means of examining the flowers.

Thelyra of Du Petit Thouars, and *Prinsepia* of Royle, are unknown to me.

281. Parinarium *campestre*, *Aubl.*—*DC. Prod.* II. *p.* 527. —*Balantium cordifolium*, *Desv. Prod. Pl. Ind. Occ. p.* 34.—On the Essequibo and Rupunoony. Schomburgk, n. 535.

282. P. (Petrocarya) *brachystachyum*, (sp. n.); foliis oblongis acuminatis basi in petiolum brevem biglandulosum angustatis subtus incanis, adultis supra glabratis, cymis folio brevioribus in axillis supremis et ad apices ramorum subpaniculatis, calycibus semi-5-fidis.—Ramuli tomentoso-pubescentes. Folia pleraque bipollicaria, juniora supra tomentosa; venæ parallelæ prominentes. Stipulæ lanceolato-acuminatæ deciduæ. Calyces parum minores quam in *P. campestri*. Petala oblonga vix inæqualia. Stamina longiora vix exserta, fertilia 7, sterilia brevia circa 8. Discus staminifer ut in cæteris speciebus pilis longis densis reflexis villosus.—British Guiana, Schomburgk, n. 785.

283. P. (Petrocarya) *coriaceum* (sp. n.); foliis ovato-oblongis acuminatis basi cuneatis subtus v. junioribus utrinque ramulisque tomento subaraneoso incanis, adultis supra glabris nitidis, staminibus sterilibus minutis v. nullis.—Arbor 30-pedalis. Stipulæ parvæ fuscæ cito deciduæ. Folia coriacea 2½—3-pollicaria integerrima nonnunquam inæquilateralia. Paniculæ thyrsoideæ axillares folio multo breviores. Bracteæ minimæ deciduæ. Calyx incurvus 2½ lin. longus incanus, dentibus brevibus ovatis acutis. Petala vix dentibus calycinis longiora. Stamina fertilia 7 vix dentibus calycinis longiora, sterilia dentiformia vel rarius uno alterove elongato. Ovarium villosum biloculare. Fructus junior carnosus subglobosus glaber monospermus, maturum non vidi.—On the brook Anna-y. British Guiana. Schomburgk, n. 65.

284. Chrysobalanus *pellocarpus*. *G. F. W. Meyer, Prim. Fl. Esseq. p.* 193.—Sand-banks of the Essequibo. Schomburgk, n. 220.—The leaves are very nearly as in the common *Icaco*, but the fruit is more that of a *Hirtella*, narrow obovoid, much less fleshy than in *C. Icaco*, and opening from the base to about the middle in five valves. The seeds have a thick testa, no albumen, the cotyledons thin but somewhat fleshy, and a very short radicle, which seems to be the case with all the *Hirtellæ* and *Licaniæ* I have been able to examine. The albumen figured and described by Gærtner appears to me to be the somewhat fleshy portion of the testa from which the outer coating is separable. Zuccarini (*Flora*, 1832, XI. *Beibl. p.* 78), describes the testa of *Hirtella* as very thin and membranaceous, closely adhering to the embryo, and the cotyledons as glued together by their margins, which I have not found to be the case in any species I have examined. Is it possible that he can have considered as belonging to the cotyledons that coating which Gærtner considers as albumen? and which I should describe as a portion of the testa, since it is certainly vascular.

Moquilea of Aublet has been joined by Martius and Zuccarini with *Couepia* of the same author, and the former appellation given to the group thus formed, which is to be regretted, as the first named genus is but little known, and the new species described all belong without doubt to *Couepia*, which may now be considered as a well established distinct group. The true *Moquilea* has nearly the flower of *Chrysobalanus*, from which, as long as the fruit is unknown, it can only be distinguished by the racemose inflorescence, and the stamens being fertile in the whole circumference of the flower; the former, in few, if any cases, a good generic character, and the latter, if adopted, requiring the corresponding adoption as genera of the above-named sections of *Parinarium*, *Couepia*, and *Licania*. I have not, however, ventured to join *Moquilea* to *Chrysobalanus*, in order to avoid further confusion if the discovery of the fruit should hereafter render it necessary to separate it again. The following new species, being n. 992

of Gardner's Pernambuco collection, has the flowers of *Moquilea*:—M. *tomentosa*, foliis obovato-v. elliptico-oblongis acutis utrinque ramisque tomento laxo candidis demum supra denudatis, racemis subsimplicibus (in *M. Guianensi* paniculato-ramosis.) Folia 2-pollicaria. Stipulæ lanceolato-subulatæ. Racemi in ramis annotinis 2—3-pollicares. Pedicelli calyce breviores uniflori. Calyces incani late campanulati semi-5—fidi. Petala parva. Stamina circa 40.

285. Couepia (Eucouepia) *comosa* (sp. n.); foliis ovato-ellipticis oblongisve acutis basi rotundatis coriaceis supra demum glabratis subtus tomento brevissimo rufis, panicula terminali stricta, calycis tomentelli tubo cylindrico, petalis extus pubescentibus ciliatis, staminibus ultra 40 orbe completo.—Folia 2—3-pollicaria, juniora supra tomento tenuissimo laxo scabriuscula, adulta vix nitida. Panicula vix basi ramosa 3—5-pollicaris. Calycis tubus 4 lin. longus, apice obliquus, laciniæ superiores tubo sublongiores. Petala superiora 5 lin. longa. Stamina pollicaria.—Falls of the Essequibo. Schomburgk, n. 28.

286. C. (Eucouepia) *bracteosa* (sp. n.); foliis ovali-ellipticis amplis brevissime acuminatis basi subcordatis crassis coriaceis rigidis supra nitidis subtus leviter canescentibus, racemis brevibus densis, bracteis ovatis appressis calyce sessili vix brevioribus, staminibus circa 40 orbe completo.—Folia 4-6 poll. longa, $2\frac{1}{2}$—$3\frac{1}{2}$ poll. lata. Venæ subtus valde prominentes. Bracteæ fuscæ dorso pubescentes margine membranaceæ. Calyces tomentosi. Petala alba glabra.—Sandy savannahs, British Guiana. Schomburgk, n. 485.

To the same section *Eucouepia*, should be referred *Moquilea grandiflora*, Mart. et Zucc.; *M. Uiti*, Mart. et Zucc.; and *M. Canomensis*, Mart.; all described by Zuccarini in the above-mentioned part of the Flora, p. 90 to 92.

287. C. (Hemicouepia) *multiflora* (sp. n.); foliis ovali-ellipticis amplis brevissime acuminatis basi subcordatis crassis coriaceis rigidis supra nitidis subtus incanis, panicula terminali tomentosa, bracteis parvis deciduis, petalis glabris, staminibus circa 30 unilateralibus.—Folia fere *C. bracteosæ* sed subtus

candidiora et majora sæpe 8-pollicaria. Pedicelli breves, inferiores cymosi 3-7-flori. Stamina 6-8 lin. longa. Flores albi.—British Guiana. Schomburgk, n. 112.—Probably near to *C. Paraensis.*

Among the described species, the section *Hemicouepia* would include *Moquilea Kunthiana,* Zucc. (*Hirtella polyandra,* Humb. et Kunth); *Moquilea Paraensis,* Mart. et Zucc.; *Chrysobalanus ovatifolius,* Schott, in Spr. Syst., and perhaps also *Chrysobalanus macrophyllus,* Schott.—Blanchet's n. 2775 from Utinga appears to be a new species of the same set.

288. Hirtella *Americana, Aubl. Pl. Guian.* I. *p.* 247. *t.* 98.—*H. racemosa, Lam., DC. Prod.* II. *p.* 529.—Banks of the Essequibo, Schomburgk, n. 23, and in a few sets also n. 7. French Guiana. Leprieur, Herb. Par. n. 81. Panama. Cuming, n. 1114.—This species varies much in the presence or absence of long hairs on the young branches, in the degree of pubescence of the spikes, and in the form of the small bracts, which are sometimes ovate at the base with a short subulate point, sometimes subulate almost to the very base. I should therefore suspect that the *H. oblongifolia, DC. Prod.* II. *p.* 529, and *Zucc. l.c. p.* 82, is the same thing.—*H. filiformis, Presl, Symb. Bot.* II. *p.* 23. *t.* 69, seems to be also the same as this.

289. H. *hexandra, Willd.—DC. Prod.* II. *p.* 529.—*Zucc. l.c. p.* 83.—British Guiana. Schomburgk, n. 80.

Gardner's n. 993 from Pernambuco, and 1591 from Ceará appear to be *H. coriacea, Zucc. l.c. p.* 83. No. 370 of Gardner's Organ Mountain collection is a new species, nearly allied to *H. hebeclada, Moricand in DC. Prod.* II. *p.* 529, and may be thus characterized :—*H. Gardneri;* "foliis subpetiolatis amplis ovatis brevissime acuminatis basi subcordatis supra pilosis subtus ramisque dense rufo-velutinis, racemis simplicibus, calycis rufo-villosi tubo turbinato, staminibus fertilibus septem." The true *hebeclada* (if I am right in my determination) has the leaves less hairy, especially above, and they are narrowed or at most rounded at the base.

290. H. *bullata* (sp. n.); foliis ovali-ellipticis vix acuminatis

basi cordatis bullato-rugosis supra hirtis subtus rufo-villosis nervis utrinque ramis racemisque densissime rufo-velutinis, racemis elongatis strictis subcompositis, bracteolis peltato-glanduliferis, calycis hirsutissimi tubo oblongo, staminibus fertilibus 5.—Folia subsessilia 3-4 poll. longa. Stipulæ et bracteæ lanceolato-subulatæ. Pedicelli 1-4—flori. Bracteolæ breves latæ glandulis stipitatis peltatis ciliatæ. Calycis tubus $1\frac{1}{4}$ lin., laciniæ tubo æquilongæ intus glabræ. Petala vix calycem æquantia. Filamenta glabra 4-5 lin. longa.—Near mount Arawogany, British Guiana. Schomburgk.

291. H. *rubra*, sp. n.; foliis ovato-oblongis acutiusculis v. breviter acuminatis coriaceis subtus ramisque velutino-tomentosis, supra scabriusculis ad venas hirtellis, racemis paniculatis, bracteas stipitato-glanduliferis, calycibus subciliatis tubo ovato turbinato, staminibus fertilibus sex.—Vix non characteri Zuccariniano *H. glandulosæ* conformis, calycis tamen tubus (1 lin. longus) basi attenuatus est, flores teste Schomburgkio rubri nec albi, et stamina fertilia semper sex. Petioli brevissimi sunt. Folia $2\text{-}2\frac{1}{2}$ pollicaria.—Savannahs near Pirarara. Schomburgk, n. 113.

Gardner's specimens from Ceará, marked in my set n. 1591? agree with *Zuccarini's* character of H. *ciliata*, excepting that I find always eight instead of seven fertile stamens.

292. H. *paniculata, Sw.—Zucc. l.c. p.* 85.—*H. hirsuta, Lam.—DC. Prod.* II. *p.* 528.—On the Essequibo, Schomburgk, n. 7.—French Guiana. Leprieur, Herb. Par. n. 58.

293. H. *eriandra*, sp. n.; foliis ovali-ellipticis acute acuminatis basi rotundatis utrinque sparse pilosulis subscabris ad venas ramulisque rufo-pubescentibus, racemo composito ferrugineo-pubescente, bracteis bracteolisque parvis subeglandulosis, calycis tubo obconico brevi, staminibus fertilibus 7, filamentis basi villosis.—Folia 3-4-pollicaria, novella, acumine excepto, utrinque velutina, adulta demum fere glabra vix coriacea. Panicula in specimine meo a ramulo laterali abscisso brevis est et parce ramosa. Bracteolæ nonnullæ, glandula unica stipitata terminatæ sunt.—Pedrero, Schomburgk, n. 886.

294. H. *scabra* (sp. n.); foliis ovatis breviter acuminatis basi rotundatis coriaceis utrinque ramisque scabro-punctatis, paniculis laxis brevibus, bracteis bracteolisque parvis nudis, calycibus leviter puberulis tubo oblongo, staminibus fertilibus 6-7 glabris.—Frutex ramosissimus 8-10-pedalis. Folia pleraque vix bipollicaria.—Near mount Roreima, Schomburgk, n. 1051.

Gardner's n. 864, and Tweedie's n. 1262, and Presl's H. *elliptica, Symb. Bot.* II. *p.* 23 in obs., are the Brazilian form of H. *triandra.*

Gardner's n. 1149 from Pernambuco, is the only *Licania* I am acquainted with, of the first section which I have called *Batheogyne;* to the sectional characters given above, the following may be added: L. *turbinata,* foliis ovatis obtusis vix acuminatis basi rotundatis subcoriaceis utrinque ramisque glabris, panicula brevi, pedicellis dichotome 3-5-floris.—Calyx major quam in cæteris *Licaniis* magnitudine fere *Chrysobalani Icaco.*

295. Licania (Leptobalanus) *pendula* (sp. n.); foliis ovato-oblongis acuminatis crassis coriaceis utrinque ramisque glabris, panicula ampla ramosissima laxa, florum glomerulis pedicellatis, calycibus incanis ad medium 5-fidis.—Arbor 30-40-pedalis ramis usque ad terram fere pendulis. Stipulæ in specimine jam delapsæ. Folia 2½—4-pollicaria nitida. Bracteæ minutissimæ acutæ. Flores albi. Calyx 1¼ lin. longus incanus, laciniis intus coloratis. Petala 0. Stamina 10 æquidistantia laciniis calycinis subduplo longiora. Filamenta basi pilosa. Fructus lineari-cylindraceus v. superne parum attenuatus, 1½ poll. longus, vix 1½ lin. diametro, carnosus, unilocularis. Semen unicum elongato-lanceolatum.—Lagoons of the Rio Negro. Schomburgk, n. 906.

296. L. (Leptobalanus) *aperta* (sp. n.); foliis ovatis acuminatis basi rotundato-truncatis coriaceis subtus tomento laxo incanis v. demum glabratis, panicula parce ramosa, florum glomerulis sessilibus v. vix brevissime pedicellatis, calycibus ad medium 5-fidis patentibus ramisque paniculæ tomento brevissimo incanis.—Arbor. Folia 2-3-pollicaria. Paniculæ

rami elongati subsimplices. Calyx 1 lin. longus laciniis ovato-lanceolatis obtusis. Stamina 2 lin. longa, glabra.—On the Curassawada, Schomburgk, n. 593.

297. L. (Leptobalanus) *floribunda* (sp. n.); foliis ovatis acuminatis basi rotundato-truncatis coriaceis subtus tomento tenui subincanis v. demum glabratis, panicula ampla ramosissima, florum glomerulis longiuscule pedicellatis, calycibus ad medium 5-fidis ramisque paniculæ tomento brevi incanis.—Folia fere L. *apertæ*, inflorescentia diversa. Pedicelli 2-5 lin. longi, floribus 3-7 dense dichotome cymosis subcapitatis.—British Guiana. Schomburgk, n. 897, and in some sets n. 871.

298. L. (Leptobalanus) *pubiflora* (sp. n.); foliis ovali-oblongis brevissime acuminatis tenuiter coriaceis subtus canescentibus, panicula ampla foliosa multiflora, floribus glomeratis subsessilibus, calycibus cis medium 5-fidis ramisque paniculæ tomentoso-pubescentibus.—Arbor. Stipulæ parvæ, fuscæ, deciduæ. Rami subteretes juniores puberuli demum glabri. Folia superiora (quæ sola adsunt) 3-pollicaria brevissime petiolata. Racemi ramosi in axillis superioribus solitarii, et ad apicem rami fasciculati paniculam formant amplam divaricatam. Flores albidi secus ramos dense dispositi. Bracteæ minutæ. Calyx $1\frac{1}{4}$ lin. longus intus villosus. Stamina præcedentium.—On the Upper Essequibo, Schomburgk, n. 136.

Licania humilis of Chamisso and Schlechtendal and *L. Turiuva* of the same authors, belong evidently to my section *Leptobalanus*, and the latter one is probably very near *L. pubiflora*.

299. L. (Microdesmia) *mollis* (sp. n.); ramulis velutino-pubescentibus, foliis ovatis ellipticisve acuminatis basi subcordatis supra nitidis glabris v. ad venas pubescentibus subtus incanis nervis velutinis, paniculis parce ramosis velutinis florum glomerulis sessilibus, calycibus incano-pubescentibus striatis dentibus ovatis, petalis subnullis.—Folia 4-6-pollicaria, petiolo brevi velutino. Stipulæ lanceolato-lineares. Paniculæ rami subsimplices. Calyx $1\frac{1}{4}$ lin. longus. Stamina

calycem vix æquantia, fertilia circa 10, 4-5 minima sterilia. Petalum interdum unicum minimum adest.—On the Rio Negro, Schomburgk, n. 910.

A second species of this section may be thus characterized: L. (Microdesmia) *rigida;* foliis obovato-oblongis obtusissimis basi rotundatis rigidis supra glabris demum nitidis, subtus incanis venis reticulatis prominentibus, panicula cano-pubescente ramis rigide divaricatis, florum glomerulis subsessilibus, calycibus incanis striatis obtuse 5-dentatis, petalis quinque minimis.—Folia superiora 3-5-pollicaria, petiolo brevi subbiglanduloso. Panicula pedalis. Bracteæ fuscæ orbiculato-concavæ deciduæ. Calyx 1 lin. longus. Petala obovata ciliata. Stamina fertilia circa 10 brevissime exserta, sterilia pauca minute dentiformia. Ceará, Gardner, n. 1592.

300. L. (Eulicania) *leptostachya* (sp. n.); foliis ovatis v. ovato-oblongis acuminatis basi angustatis supra glabris subtus ramulis racemisque tomento albo lanatis, racemis elongatis subsimplicibus basi foliosis, florum glomerulis sessilibus, calycibus campanulatis tomentosis quinquedentatis, staminibus fertilibus circa sex, fructu albo-lanato.—Arbor 30-50-pedalis. Rami penduli. Folia fere *L. incanæ,* subtus tamen densius tomentosa. Racemus (seu spica) interruptus, gracilis, 3-8-poll. longus; glomerulæ inferiores foliis caulinis conformibus subtensæ, superiores bracteæ lanceolato-subulatæ. Calyx linea parum longior, latius quam in *L. incana.* Fructus oblongo-clavatus semipollicaris.—On the Upper Rupunoony, Schomburgk, n. 111.

301. L. (Eulicania) *incana, Aubl. Pl. Gen.* I. *p.* 119. *t.* 45; foliis ovatis v. ovali-oblongis acuminatis basi plerisque angustatis vix coriaceis supra nitidis subtus incanis utrinque venosis, racemis terminalibus axillaribusque subramosis, ramis brevibus densifloris, calycibus subgloboso-campanulatis, fructu obovoideo-oblongo incano.—Folia 2-pollicaria (v. teste Aubletio 3-pollicaria). Stipulæ lineari-lanceolatæ. Racemorum ramuli vix pollicares. Flores 1 lin. longi sessiles incani. Stamina inclusa, 5 inferiora fertilia, e quibus illa laciniis calycinis opposita longiora sunt.—Pirarara, Schomburgk, n. 728.

302. L. (Eulicania) *crassifolia* (sp. n.); foliis ovatis v. ovali-oblongis acuminatis basi plerisque rotundatis crassis coriaceis supra nitidis subaveniis subtus incano-tomentosis, racemis axillaribus terminalibusque subramosis, calycibus subgloboso-campanulatis, fructu breviter obovoideo rufo-tomentoso.—Vix *L. incanæ* varietas. Folia consistentia multo crassiora. Racemi potius rufi quam incani. Fructus crassior brevior.—Savannahs of the Rupunoony, Schomburgk, n. 388, and in some sets 381.

303. L. (Eulicania) *coriacea* (sp. n.); foliis ovato-oblongis obtusis v. vix obtuse acuminatis crassis coriaceis supra nitidis subtus subcanescentibus, racemis terminalibus parum ramosis, ramis elongatis rigidis multifloris, calycibus ovato-campanulatis.—Folia sæpe obliqua 2—3-pollicaria. Stipulæ minutæ subulatæ. Rami paniculæ 2—3-pollicares. Florum glomerulæ sessiles. Calyces incani ultra 1½ lin. longi.—On the Essequibo, Schomburgk, n. 50.

304. L. (Eulicania) *parviflora* (sp. n.); foliis ovatis acuminatis crassis coriaceis supra nitidis subtus minute lepidoto-subcanescentibus, paniculis parce et rigide ramosis, florum glomerulis subsessilibus, calyce globoso-campanulato breviter 5-dentato, staminibus fertilibus 5 brevissimis.—Folia 2—3-pollicaria. Stipulæ subulatæ. Flores non incani vix ½ lin. diametro. On the Rio Negro, Schomburgk, n. 977.

305. L. (Hymenopus) *divaricata* (sp. n.); foliis ovali-ellipticis oblongisve brevissime et obtuse acuminatis basi rotundatis cuneatisve glabris coriaceis, panicula divaricato-ramosa pubescente, florum glomerulis subsessilibus, calycibus campanulatis minute pubescentibus 4—5-dentatis, petalis 4—5, staminibus fertilibus circa 7.—Arbor 30—40-pedalis. Folia 3—5-pollicaria. Stipulæ lineari-lanceolatæ crassiusculæ deciduæ. Flores vix 1 lin. longi. Petala dentibus calycinis subæqualia. Stamina dentibus calycinis vix æquilonga, fertilia sæpissime 7, semel tamen 8 vidi.—Sandy soil, British Guiana. Schomburgk, n. 463.

306. L.? (Hymenopus?) *heteromorpha* (sp. n.); foliis obovato-oblongis v. obovato-ellipticis obtusissimis emargi-

natis, basi angustatis utrinque glabris, petiolo brevissimo biglanduloso, panicula terminali ramosa, florum glomerulis sessilibus, calycibus aliis globoso-campanulatis dentibus subæqualibus, aliis longe infundibuliformibus dentibus 2—3 maximis.—Folia 2—3-pollicaria. Stipulæ lineares, deciduæ. Panicula tomentosa, ramis vix ramosis. Flores numerosi parvi tomentosi, æquales sessiles vix $\frac{3}{4}$ lin. longi, irregulares 1 lin. longi in stipitem longiuscule attenuati, calycis limbi dentibus 2—3 tubo æquilongis, 3—2-brevissimis, calyces nonnulli inter has formas intermedii. Petala in utraque forma 4—5 minima. Stamina fertilia circa 5.—Pedrero on the Rio Negro, where the bark and leaves are used for making a scarlet dye. Schomburgk, n. 873.

Combretaceæ.

307. Laguncularia *racemosa, Gærtn.—DC. Prod.* III. *p.* 17.—French Guiana, Leprieur.

308. Combretum *elegans, Humb. et Kunth.—DC. Prod.* III. *p.* 19.—British Guiana, Schomburgk, n. 87, in some of the later sets.

309. Combretum *aurantiacum* (sp. n.); inerme, arborescens, foliis ovali-ellipticis oblongisve breviter acuminatis supra glabris subtus lepidotis, spicis axillaribus ebracteatis, calycibus infundibuliformibus aureo-lepidotis, staminibus longe exsertis, fructibus obovato-subrotundis late 4-alatis aureo-lepidotis.—Folia angustiora minora quam in præcedente, fructus breviores. Calyces supra ovarium tenues apice lato-campanulati, nec ab ovarii apice tubuloso-campanulati. Flores aurantiaci nec rubri.—On the Essequibo, Schomburgk, n. 87 in the first sets.

310. Combretum *obtusifolium, Rich.—DC. Prod.* III. *p.* 19?—On the Essequibo, Schomburgk, n. 55.

311. Cacoucia *coccinea, Aubl.—DC. Prod.* III. *p.* 22.—In moist situations on the banks of rivers, British Guiana, where the seeds are used for poisoning bats. Schomburgk, n. 272.

RHIZOPHOREÆ.

312. Cassipourea *serrata* (sp. n.); foliis oblongo-ellipticis acuminatis breviter late et argute serratis basi rotundatis, floribus subsessilibus, petalis pinnatim multifidis.—Frutex, ramis junioribus puberulis demum glabratis. Stipulæ lanceolatæ sericeæ deciduæ. Folia ultra 6 poll. longa, 2—2½ poll. lata, juniora margine et subtus sericea, adulta glabra. Flores fasciculati, 3 in quaque axilla, bracteis brevissimis ovatis ciliatis circumdati. Pedicelli vix 1 lin. longi, crassiusculi. Calyces 2½ lin. longi campanulati vix ad medium 5-fidi, crassiusculi, extus adpresse pubescentes intus sericei æstivatione valvata. Petala 5 oblonga, stipite filiformi, laciniæ longæ subulatæ plumoso-ciliatæ in alabastro plicatæ antheras foventes. Stamina circa 25 cum petalis ad basin calycis perigyna, ima basi cohærentia in annulum interne expansum in discum brevem perigynum multilobatum. Filamenta exserta glabra. Antheræ oblongæ, loculis rimi longitudinali dehiscentibus. Ovarium basi lata calyci affixum, depresso-globosum, hirtum, triloculare, ovulis in quoque loculo 2 pendulis. Stylus rectus exsertus, hirtus, integer, stigmate dilatato-trilobo.—On the Essequibo and Rupunoony. Schomburgk, n. 527.

(To be continued.)

XIII.—*Journal of a Tour in Ceylon;* by Mrs COLONEL WALKER.

(OUR readers may recollect that the first article in the "*Companion to the Botanical Magazine,*" was an account of the ascent of Adam's Peak in Ceylon, from the pen of the same accomplished lady. During every excursion of this kind, both Colonel and Mrs Walker have been indefatigable in collecting the vegetable productions of this rich and fertile island; and we trust ere long to have it in our power to make known many, if not all, of these interesting discoveries, which have been so liberally communicated to us.—W. J. H.).

"My Dear Sir William,

"You were kind enough to give my little journal of our excursion to the top of Adam's Peak so flattering a reception, that I felt inclined, on my return from a tour which Colonel Walker and I made in February and March, to communicate to you the result of our observations and remarks during our progress through parts of the island, till then unknown to us, and indeed, in some places, not previously visited by any European. Various circumstances have hitherto prevented my putting this intention in execution; amongst others, the extreme heat of Colombo this season quite incapacitated me for any exertion either bodily or mental; and now that the change of monsoon has cooled the atmosphere, I find the time that has elapsed since my return, has so much weakened the interest of the subject, even in my own estimation, that I fear I cannot hope to render it amusing or interesting to others. Besides this, there is the *awful* idea presenting itself to my imagination, that my lucubrations may appear *in print!* which, however foolish it may be, does influence me in some degree. And the very attempt at doing something better may deprive my little narrative of the only merit my Adam's Peak Journal could pretend to, viz., that of having no pretensions whatever, having literally been written entirely for my own amusement, without an idea of its ever meeting any eye save my own. I shall, however, as you formerly expressed a wish for such communications, look over the journal, or rather notes, kept on our excursion, and give you whatever may appear worth transcribing.

"We left Colombo on the 26th of January, and bent our course towards Point de Galle, the southernmost extremity of Ceylon; this route is too well known to admit of any thing new being said on the subject. The road runs almost the whole way close to the sea, and is mostly through a continued *Cocoa-nut forest.* The country is populous, there being straggling villages on each side of the road; yet, if you except the cocoa-nut plantations, there is little cultivation to

be seen; indeed, none, but occasional small patches of the *Sweet Potatoe* (*Convolvulus Batatas*), or what I believe, is now called *Batatas edulis*, which they plant on little mounds like new-made graves in a country church-yard. Between Amblamgoddĕ and Hukady, wherever there is water sufficient for the purpose, the air is poisoned by the effluvia from the decaying cocoa-nut husks, which are steeped, as flax is at home, to prepare them for the manufacture of coir rope; the smell is even more offensive than that of flax undergoing the same operation. In this stage of the journey, there is also a good deal of lime made from the coral and shells collected on the beach, for burning which, we remarked quantities of the trunks of old *Cocoa-nut Trees*, cut up into regular lengths; we were led to notice this circumstance, as, generally speaking, I do not think the cocoa-nut is ever used as fire-wood for domestic purposes. The smoke from these lime-kilns, is only *not quite* so bad as the putrid cocoa-nut husks, so that, altogether, this is a disagreeable stage to the traveller, although there is some little appearance of industry in it, not met with elsewhere on this route, where the people seem perfectly idle. It is probable that their only occupation is that of fishermen, as the beach is covered with small fishing *Dhonies*, in which they fish at a considerable distance from the land.

"I shall give you separately, a list of the plants, cultivated and uncultivated, which we remarked between Colombo and Galle; and only mention here those used for any particular purpose, or such as greatly abound. At Cultura, they make hedges of the *Cerbera Manghas* in that neighbourhood; and as far as Amblamgoddé, *Convolvulaceæ* are very prevalent, extremely various, and many highly beautiful. From Bentotté, where the Galle district commences, the vegetation begins to vary, the prevailing plants being *Cactus*, *Pandanus odoratissimus*, and *Crinum toxicarium*, which covers acres in some places and of which, and the *Pandanus*, fences are made. In a river near Galle, we found the *Nymphea Lotus*, with deep rose-coloured flowers, in great abundance; the natives

eat the roots of this plant, the seeds also are chewed by the children. The neighbourhood of Galle is swampy, and in this wet soil *Delivaria ilicifolia* is very common, and the *Cerbera Manghas* grows to a great size, quite a forest tree.

"From Galle we made an excursion up the Ginderah river, as far as it is navigable. The bank, on one side, has been lately cleared of wood and jungle, and a towing path made which enables boats to be impelled against the stream. We embarked at a place called Wak-wellé, about five miles from Galle, at 7 A.M., and reached Badagamme, a quarter past 9. The scenery, rich and pretty but flat, reminded us of some parts of Bengal; we saw nothing new in the botanical way, in the course of this day's journey. Badagamme is remarkable as having been the first missionary station where a church has been built in the interior of the island; and a sight so uncommon in this part of the world, cannot but excite the most gratifying feelings from many causes; but from none more than the recollections of *home*, with which the appearance of a village church is associated: there are likewise schools for the native children, and two good houses for the resident missionaries. I visited this place fifteen years ago, when the foundation of the church was just laid, and then thought the establishment promised well, and certainly expected much more would have been effected ere this time; but I believe there is little perceptible improvement in the habits or character of the natives. It is difficult even now to induce them to send their children to school; the congregation at church, the missionary told me, consists almost entirely of children; from which it would appear, that the former pupils cease to attend when grown up and become their own masters. The vegetable kingdom seems to improve more under the care of the missionaries than the moral world: every thing planted in their gardens appears to thrive luxuriantly. I never saw the fruit of the *Flacourtia inermis* so fine any where; it makes an excellent jelly, much resembling, and I think as good as, the red currant at home; it is called by the natives *Lowilowi*, and by the English here *Looy looy;* it is

also used for tarts. The *Rambootan*, (*Nephelium lappaceum*), an excellent fruit, and the Bread-fruit (*Artocarpus incisa*), appear to thrive vigorously, and we here found for the first time, the *Croton variegatum* in full flower.

"The church and houses of the missionaries, as well as that we occupied, belonging to our friend Mr W., agent for government in the extensive district of Galle, are all situated upon distinct small hills, or knolls, surrounded by *paddy* fields, which are probably under water in the rainy season. We spent the next day at Badagamme, in hopes our collectors might pick up something new in the neighbourhood; but although the vegetation is very luxuriant and varied, they brought us nothing uncommon. *Convolvuli* abound, and the *Impatiens cornuta* is very frequent here, and in many other places on the coast, as well as in and about Kandy.

"The banks of the river during our next day's progress were pretty, and clothed with fern and many other plants, but few of them were in flower; I only observed *Ixora coccinea*, *Melastoma Malabarica*, and a species of *Nerium*, which appears to differ much in its habits from *N. Zeylanicum*, being found only on the banks, and hanging quite over the river; but, on examination, we could detect no difference except in the size of the leaves, which are much narrower, a point hardly sufficient to establish another species, as the shape and size of the leaves of many plants vary so much in the same species. About three miles from Badagamme, low hills appear in the distance; the navigation of the river is much impeded by drift-wood and trees, which must have been unavoidably precipitated into it, when clearing the steep banks for the towing-path. Our boat, though very comfortably fitted up for the traveller, we found of a bad construction for river navigation; it was on the principle of the common canoe, with what is called the out-rigger, which requires *sea-room;* it frequently caught in the drift-wood, or stuck among the rocks where the channel was sufficiently wide for a larger boat to have passed through with ease. A broad flat-bottomed boat I should think better suited to river navi-

gation. As we proceeded, the hills in the distance increased in height, and about 2 P.M., we had our first view of *Hinnidoon Kandy*, called by the English the *Haycock*, from its form, an object of interest to us on the present occasion, as an ascent to the top of this mountain was to terminate our excursion in this direction. Our being able to achieve this feat or not, had caused much discussion, and given rise to some bets among our Galle friends. This hill, though not much above two thousand feet in height, so much overtops all the surrounding country, that it is a very conspicuous object at sea, and all ships approaching the island from the east or south, make the Haycock before any other part of the land is visible. The Deputy-assistant quarter-master-general, who had lately ascended it, found it a particularly commanding spot from whence to take angles, make observations, &c.

By 3 P.M., we arrived at Maplegame, where we were to remain for the night, being obliged to halt where we could find lodging; this was a horrid place, a native house situated under foliage so dense as to exclude light and air. We found however a pleasant walk, with some pretty views of the surrounding country, the Haycock conspicuous in the distance, and remained out till dark. Our dinner was prepared in an open space with a roof over it, surrounded by a wall two or three feet high, in front of the house, leaving us completely exposed to the gaze of a mob of people assembled from the neighbouring village, who had probably never witnessed the *Knife and Fork exercise.* This publicity I disliked very much at first, but I found it a vain attempt trying to get rid of our spectators; for if our servants sent them off, they either returned immediately, or were succeeded by another set as numerous as the first. This was the case throughout the whole of our journey, and we found ourselves obliged to submit quietly. In our walk we observed two or three different species of *Laurus*, and two *Loranthi*, new to us. Notwithstanding much coughing and squalling of children during the night, we contrived to sleep more comfortably than we had expected; but were glad to take a very early

breakfast, and depart from this disagreeable place as soon as we could.

"From hence we were told we should find some difficulty and encounter five dangerous places on the river, which was so low, that even the boatmen entertained doubts of our reaching the village of Hinnidoon; however, patience and perseverance, with the exertions of our boat's crew, (who really did not spare themselves,) conquered all obstacles, and we got to the end of our *voyage* at 4 P.M., having hardly discovered when we surmounted the *five dangers* we had been prepared for. These were some rocky rapids, however, which when the river is full and the current strong, may be rather perilous.

"This morning, just as we embarked, we observed a young alligator plunge into the river close to the boat; hitherto we have hardly seen any living animal, very few birds, very few insects, and no fish, though we were told they abound in the river. This alligator, the first and last we met with on our journey, and a white monkey, were all we remarked. The *Amaryllis Zeylanica* was common on the banks; and a species of *Aponogeton*, the roots of which the natives eat, is very abundant in the bed of the river, where I saw several old women up to their middles in the water employed in collecting it. In many places the banks were clothed to the water's edge with a species of *Bassia*, and a tree remarkable for the deep and bright red colour of its young shoots. Our people called it a kind of *Ironwood*, (*Mesua*,) which it certainly resembles in this particular; but as we could neither procure flower nor fruit, we had no means of satisfying ourselves on this subject. *Arum spirale* was also frequent in the river.

"The Genderah seems to flow through a tolerably well cultivated country, the land on each side being enclosed, and fences running down to the river-bank. The scenery is pretty, and the fragile looking temporary bridges erected in many places over its tributary streams, add much to its picturesque beauty; some of them are very high, and of considerable length, consisting merely of the trunks of trees, and requiring

a very steady head to venture across them. In a short time, however, I doubt not this river will be cleared, and good bridges built, so as to render the navigation easy and expeditious, as a spirit of improvement and enterprise has been awakened in the district, from the liberal and enlightened policy of the agent of government. A considerable grant of land has been lately applied for by a gentleman acquainted with the cultivation of the *Sugar cane*, which he thinks likely to succeed well in this part of the island. The plant is known to thrive in many places, but it has never been cultivated to any extent, nor any trouble taken to introduce the best kinds. With capital, skill, and industry, I have no doubt Ceylon may become one of the most fertile countries in the world; every thing grows so luxuriantly here. But I must return to Hinnidoon.

"From the Rest-House we set off about 8 A.M., crossed the river, and travelled a mile or more before we commenced the ascent of the Haycock hill, which we found exceedingly steep, very long and very fatiguing; its first abrupt rise is rugged, the hills covered with coarse grass and many low shrubs common about Colombo. After accomplishing this first stage, as it may be called, the view is very beautiful, the path continues for some distance along a level ridge descending a little in some places. Before again beginning to ascend, the path enters a thick wood of various forest trees, and soon becomes exceedingly rugged and steep, without a level resting place till the summit is attained; the wood and jungle all the way so thick and high, that nothing can be seen, and the air so much excluded as to render the heat very oppressive. We were told that in the dense forest which covers this mountain, are found many of the most valuable woods of the island, Ebony, (*Diospyros Ebenum*) Calaminder (*D. pubescens*) Satin-wood, (*Swietenia chloroxylon*), and many others, of which a long list was given us by the Modlear, or headman of the district, who had been prevented by public business from accompanying us to the top of the hill, but joined us at our return to the rest-house. The *Nepenthes*, so common in

the *cinnamon* plantations about Colombo, grows here to a great size; I remarked it climbing over the tops of high trees, its leaves and pitchers greatly exceeding in dimensions any I had seen elsewhere. Many of the trees were clothed to the summit by *Pandanus scandens*, and *P. humilis* also abounds; of the leaves of this plant, which are upwards of three yards in length, the natives make mats; the perfume of its blossoms is even stronger than that of the flower of *P. odoratissimus*, in a room, it is overpowering, though fragrant in the open air. Of the *Palm tribe* we saw several, particularly the thorny *Caryota*, and *C. mitis*, the flower of which is exceedingly beautiful when it first bursts through its green spathulate bracts and calyx of deep rose-colour, shading off to a pale pink, adhering closely, though at irregular intervals, to the pure white ivory-like pedicels which form the large drooping panicle. I attempted to draw it, but could not at all please myself, and gave it up in despair.

" It was twelve o'clock when we got to the summit of the mountain, and the wood having been recently cut down by the deputy-quarter-master-general's party, we had a most extensive view although the day was not very clear, and we were perhaps too late in getting to the top to see as much as may be descried under more favourable circumstances. To those who have no object in ascending this hill but to admire the beauty of the scenery, I should say their trouble and fatigue would not be recompensed; and advise their being satisfied with the view from the level ridge, at the top of the first ascent before entering the wood, from whence in my opinion the scenery looks much more beautiful, though of course, not so extensive. Precipitous and rugged as the path is, my Coolies contrived to carry me in my little Madura palankeen, nearly to the top, not without my frequently feeling under considerable apprehension of being tumbled out: however, no accident happened. The latter part of the way I was obliged to walk, or rather scramble, as I also did all the way down to the top of the first rise, affording food for an abundance of leeches as I went along. This was

the first time I had ever been bitten by these creatures, though I had often witnessed their voracious attacks upon others; I had a great dread of them, but experienced no inconvenience from their bite, not even being aware of it till I found myself bleeding profusely in many places.

"We got back to the rest-house about 4 P.M., a good deal fatigued, and covered with blood and mire. Remained at Hinnidoon next day, examining our botanical acquisitions, having sent our people to collect every thing new to be found in the neighbourhood. At 8 next morning we embarked, and got to Badagamme about half-past 4, where we slept and spent the next forenoon, returning to Galle in the evening, after a very pleasant excursion with which we were much gratified.

"On the 18th of February, we again set off from Galle, on our route to Matura, but made a slight détour from the main road to visit Cogle lake. On one of its seven Islands, our friend Mr W. has a comfortable bungalow, where breakfast was prepared for us. Between Galle and Cogle, the whole of the coast plants seem to be concentrated; we found, in that short drive, *all* the plants we have between Colombo and Galle, and in the lane leading from the main road to Cogle, many others, particularly *Solandra oppositifolia* (of Moon) which I had never met with on the coast before. In and about Kandy, however, it grows almost to a tree; here it is only a large bush. A *Pancratium*, very handsome, *Gomphocarpus volubilis*, the beautiful Cultura *Convolvulus*, (*Pharbitis?*) which I had seen nowhere else, and many others not in flower. I was quite surprised by the extent and beauty of the lake, and its islands, all of which are covered with thick jungle, excepting the one on which Mr W.'s bungalow is situated; he has here also a kind of menagerie, where there are some very fine elk, and other species of deer, monkeys, &c. In high tides this pretty sheet of water communicates with the sea, from which, at one extremity, it is only separated by a narrow sand-bank. The water at Wilmot Island is brackish, but said to be fresh farther from the sea; it seems of considerable extent, abounds

with fish, and the Cogle crabs are considered particularly good. Alligators are not uncommon, and we were told a sheep had been seized and carried off the island a short time before we were there.

"Having sent our gig and horses round to the end of the lake near the sea, by which the Matura road runs, with the intention of rowing down the lake to join them again, we were advised, from the high wind and threatening appearance of the weather, not to delay our departure too long, and therefore set off at 12 o'clock. Our boatmen did not prove themselves *weather-wise*, as the wind, instead of increasing as they foretold, soon fell considerably, and after an hour's rowing, we reached the extremity where we found our carriage waiting for us; in fact, I suppose the people wished to get rid of us as soon as they could, that they might enjoy the rest of the day in idleness. In passing pretty close to one or two of the islands, we ascertained the most prevailing trees to be *Sonneratia acida*, a *Ficus*, new to us, *Ardisia solanacea*, and a shrub which we had found on the road between Bentote and Amblamgoddé, with which we were unacquainted. On leaving Cogle lake, we lost the luxuriant and varied vegetation which had been so remarkable during our morning's drive, and for several miles saw nothing but *Cocoa-nut* trees. The first novelty we met with in the vegetable world, was some fine trees of the *Barringtonia speciosa*, which we had not observed since we left Colombo, and we again saw *Tournefortia argentea* and *Convolvulaceæ* in abundance, varying in colour, and in the size of their leaves, but, I believe, only varieties of those we had formerly met with about Cultura, and elsewhere. We reached Belligame between 2 and 3 P.M., and in the evening took a walk, to see a figure as large as life, cut in relief, upon a rock, not ill executed and said to be a Rajah, whose name I forget, and of whose history I am profoundly ignorant. In a garden near the rest-house, we found a species of *Hernandia*, new to us, a large handsome tree in full flower.

"Left Belligame at 6, and got to Matura before 8 A.M.,

nothing remarkable presenting itself on the road; but the place, which in this part of the world may be called a *town*, surprised me by the number of large and comfortable looking houses it contained. I found, afterwards, that many of the most wealthy and respectable native families live here. The fort of Matura, within which the rest-house is situated, is very pretty, and the rest-house excellent. The plants we particularly remarked in our drive this morning, were *Solandra oppositifolia*, *Calanchoe pinnata*, and *Stravadia rubra*, which ornamented the road on each side, in many places. *Delivaria ilicifolia* abounds in the ditch round the fort of Matura, where we remained all next day, to make arrangements for our future journey; as, from hence, our mode of travelling was to be entirely changed, the roads to the interior admitting of no wheel-carriages, hardly a bridle path.

"In the evening we drove to Dondra head, which I had fancied a fine bold promontory, and with this preconceived idea, passed the place, without knowing it; till, observing our drive to be much longer than was anticipated, we discovered that we had gone far beyond the point we were in search of, which, on our return, we found to be no way very remarkable, a low rocky point, seen from the fort of Matura.

"*Tuesday*, 21*st of February.*—At 4 P.M. we left Matura after a great deal of trouble, with the only really *determinedly* insolent set of Coolies I ever met with in Ceylon. The people, now aware that they cannot be forced to work, if disinclined, and that, in fact, travellers are completely in their power, do exactly as they please; setting at defiance all established regulations, as to the weight of their burdens, the sums they are to receive daily, or according to distance, (so much a mile,) fixed by government. Even after forcing the hapless wayfarer into their own terms, they frequently refuse to complete the distance they have been engaged for, put down their loads, and declare they will go no further, having taken care to be paid so much in advance, without which they will not stir. This bad start alarmed us as to our future progress, and indeed, throughout our journey it proved our only

difficulty, though we met with none so bad as the Matura people. In the interior, the natives still retain a kind of awe for the headmen, through whom we succeeded in procuring coolies; but this will not last long, and even now, the headmen are disagreeably circumstanced, in being obliged frequently to give orders, which they have no power or means to enforce. This state of things certainly requires to be amended; but how, I do not pretend to know.

"We got off, however, at last; Col. W. on my pony, an animal, as he knew from experience, well calculated to surmount the difficulties we were likely to encounter, and I in my Madura palankeen, having sent back our gig and horses, and dismissed our baggage carts (here called bullock bandies) at Matura. For the first two miles our road passed through what the natives term gardens, in most of which were respectable looking houses; then we travelled for a mile on a raised dyke or *daur*, as it is here called, through a swamp, in many places under water; the remaining part of our evening's journey through paddy-fields, from which the crop had just been removed. Slept in a house belonging to a native headman, at a place called Attadewa, and saw many plants, but nothing new. A good deal of coffee seems to be cultivated by the natives in their gardens.

"Our road next day continued for four miles through paddy fields, on good raised embankments, with low wooded hills in the distance, a fine fertile and (for Ceylon) well-cultivated country; most of the way near the course of the Pantura river, which we crossed, and again travelled through enclosed gardens, containing *jack*, *bread-fruit*, *cocoa-nuts*, *plantains*, and *coffee*. The remaining part of our day's journey was again through paddy-fields, on which the crop was still standing. I saw a number of the birds here called *water hens;* when alarmed by our approach, they always ran towards the river. I never observed them take wing. By ten o'clock we reached Wellihené, our halting-place for the day. Boodu appears in higher consideration in this part of the country than on the coast, if we may judge by the size and

respectable appearance of several temples dedicated to him, which we remarked in this stage. Doors do not seem to be considered necessary at Wellihené, at least there were none to the hut which we occupied, and our night's rest was disturbed by the visits of two Pariah dogs, which annoyed us greatly. From Wellihené to Mura Wakka there is less cultivation, more jungle, the distant hills are higher, and our road not so level as it has hitherto been. Reached Mura Wakka at nine. Here we found most comfortable quarters in a house belonging to the Modlear of the district, who was waiting our arrival at this place. We remarked on our route two large Boodist temples, but of more fragile materials than those seen yesterday, which were solid brick buildings. We again crossed the river by a ferry-boat, which we found gaily decorated with cocoa-nut leaves, &c., in compliment to us. This used to be done formerly at all the rest-houses, ferries, &c., whenever Europeans, of any rank in the service of government, travelled. The washermen of the village were obliged to find clothes to cover the walls and roof, and even to spread on the floor, for which they were entitled to no remuneration. Now, this is all dispensed with, or if ever done, the people do not fail to claim something for their trouble, which it is but fair they should receive. In front of the Modlear's house at Mura Wakka, there is the largest *Bombax* (*pentandra*, I believe,) I ever saw. During the day I generally amuse myself by drawing any thing we may have picked up by the way, either pretty or uncommon, and take a walk in the evening. This place is remarkable for the quantity of rain which falls about it, and the weather did look so threatening, that we were afraid to venture any distance from the house. Some loud claps of thunder, however, cleared the air, and a little rain fell—just enough to spoil our stroll, and to make the leeches very active; they are a great nuisance, and destroy the pleasure of walking in the country, if the soil be in the least damp: when perfectly dry, the leech is never seen, but after the slightest shower, the ground seems alive with them. Left our com-

fortable quarters at 6 next morning. Road mostly through low jungle, with occasional paddy-fields. Breakfasted and remained till 3 in the afternoon at a place called Kattepoolla. A native here displayed a very fine *cheetah** skin, which he seemed anxious that we should purchase: he had shot the animal in the neighbourhood some weeks before. Soon after leaving this place, we commenced ascending a very steep and rugged hill; the sun excessively hot. Near the summit we began to find plants common about Kandy; a species of *Rubus*, and some *Acanthaceæ* not found on the coast. In about half-an-hour, we turned off the road to see a very fine cascade, formed by the fall of the Matura river (near which we have travelled almost all the way) over very high and bold rocks, clothed with magnificent wood; a sight which well repaid the trouble of scrambling about a quarter of a mile through the jungle and down a pretty steep hill. Our friend the Modlear, however, had facilitated our progress, by having a path cut through the jungle for us. The river is here called the Kiriwané Ella. Our route continued rather rugged, until we approached Birilapanatra, when it became level, and the country cultivated. The neighbourhood appears very populous. We reached our halting-place about 6, followed by a crowd of people, and all the children from all the villages round, who, never having seen a horse before, far less one with a man upon his back, took Colonel W. for some centaur or other unknown monster. Of this crowd we could not get rid as long as daylight continued; but, fortunately, the pony was more the object of attraction than ourselves. An assistant Wesleyan missionary has resided at this place for four years. He has several schools in this and the neighbouring villages, but he does not himself seem to think his labours have been attended with any very beneficial effects; at least, he says the progress is very slow, though he hopes there are some symptoms of improvement among the natives. He owns, however, that

* The hunting Leopard of the East Indies.

even those who profess to believe in Christianity, are apt to recur to their old superstitions, when attacked by illness or any other misfortune—inflictions, they suppose, of demons or evil spirits, and to propitiate whom they make their offerings and address prayers for relief. The poor man seemed very tired of his long banishment, and anxious to be removed from this station.

"As we were to have a new set of Coolies here, we were obliged to remain next day to make arrangements; for even with the assistance of the Modlear, we had great difficulty in procuring people, and without him should never have succeeded. I was disappointed with the appearance of the country in this vicinity, having heard it highly extolled. I believe, however, the soil is very fertile, and produces fine crops of paddy, the only article raised; but I doubt not that coffee and other things would thrive as well were they tried. Until the place becomes more accessible by good roads being made, there can be no inducement to any one to settle here, or cultivate with a view to export produce. The expense of carriage would swallow up all profit; but I believe it is in the contemplation of government to clear roads through the district, which I should imagine might be done without much difficulty. The paddy grounds form the greatest obstacle, as the roads must be very much raised and extremely solid, the crop requiring to be almost constantly inundated. I was wrong in saying *nothing* but *Rice* was cultivated at Birilapanatra; as the surrounding hills have, in many places, been divested of jungle for the purpose of planting Kurakkan, (*Eleusine*) and other grain requiring less moisture. The people clear the sides of the hills, cut down the trees, and burn the jungle; then *scratch* up the earth a little and sow their seeds. After getting only one crop from it, the land remains fifteen years useless, during which time the jungle springs up again, and the same operation is repeated. I have remarked that the first plant which grows on the lately cleared land is a species of *Croton*, which is very abundant in every part of the island I have visited, frequently covering a great extent of ground

to the exclusion of all other vegetation. I do not think we found any new plants in this neighbourhood. Among the trees *Vateria Indica* is common, from the seeds of which the natives make a kind of bread; they prepare it for use, by taking the inside of the fruit out, this they wrap in a cloth, covering the whole with a quantity of the leaves of the tree; it is then placed for some hours in a stream of running water, and is not eatable until it has undergone this process. The resin which exudes from the tree is used by carriage painters, I suppose, as a varnish. The Mura Wakka Modlear who accompanied us, is my authority for the above mentioned facts.

"26*th February*.—This day we entered *terra incognita*, no European having travelled farther on our present route. We started a quarter past 5, A.M., the first half hour through paddy fields, which is the most disagreeable of all travelling, the paths being too narrow to afford room for two men abreast, as my Coolies carry my palankeen, or even safe footing for a horse; add to this, the inequality of the surface, from the succession of small dykes, or embankments, formed to retain the water, which are not apparent when the crop is standing, and it may be easily imagined how very unpleasant it is to travel over. We then crossed a ridge of hills, more paddy-fields, and more hills, our whole route being a succession of cultivated valleys and jungle-covered hills, the valleys becoming narrower and the hills more rugged and mountainous as we advanced towards the interior of the island.

"At a place called Kattewelle, we entered the Colona Corle, where the authority of our friend, the Modlear, ceased, and were soon after met by the *Standard-bearers*, *Tomtomers*, &c., of the *Coral*, or headman of the Corle, or district, a remnant of Kandyan customs now rarely practised. One man prostrated himself on the ground before me, touching it with his forehead, a degree of servility one does not wish to see from one human being to another; but, in general, the Kandyans have gone to the opposite extreme, and are now barely civil, even to the governor. The Coral having had intimation of our approach, had had the path cleared of jungle and made

otherwise passable, though in some places rather narrow; and I was sometimes apprehensive that the two outside Coolies might have slipped down the precipice, but it is astonishing how they contrive to keep their footing, where one would imagine none but a goat could cling. Between eight and nine arrived at Dapene, where we found the Bungalow gaily decorated in the Cingalese fashion, with *cocoa-nut leaves, Areca-nut* flowers and fruit, *Lycopodium*, &c., and breakfast prepared for us. We found here another very handsome *Erythrina*, and great quantity of *Phœnix farinifera* in the jungle. At eleven, we again set forward, drums beating and colours flying, to gratify the Coral, who joined us here, and seemed disappointed at our not having allowed his musicians to perform, after they met us on the confines of his district. The road now became mountainous and rugged, with occasional narrow strips of cultivation in the valleys; about half way down a very long and steep hill, an opening in the jungle afforded us a very extensive view of a flat country towards the sea, which I doubt not is visible on a clear day, probably the Tangalle, and Hambantotte districts. As we descended this mountain, the dwarf-jungle gave place to fine forest-trees of various descriptions, amongst which I recognised some splendid *Dillenias*, and *Horsfieldia odorata* of a great size. In this forest our people also found the *Ceylon Gamboge-tree*, Dr Graham's *Hebradendron;* the leaves appeared to me larger than those we had formerly seen; but as we could not procure either fruit or flower, we could not ascertain if the plant differed in any other particular. The *Gamboge* oozed copiously from the pieces of the bark our servants brought to us. At the bottom of this hill, by the side of a pretty stream, and under the shade of fine trees, where our people stopped to rest themselves, Colonel W. found two or three new plants; and I remarked a number of beautiful *Dragon-flies*, and some large and showy *Butterflies*. From hence our road was more level. The prevailing plant in the jungle *Phyllanthus Embleca.* We arrived at the Mado-wanwelle, (the *capital* of the district) at half-past 2, preceded by the Coral's band,

thumping and blowing with might and main, and followed by the inhabitants, old and young, male and female, of every village we passed through: the people being so idle that they never have any occupation to keep them at home. The country appears very populous, Mado-wanwelle being a very large village, less straggling than is generally the case in this country, and the houses situated near each other, and under the finest *Jack-trees*, I ever saw; one, near the Coral's house, measured more than twenty feet in circumference.

"On our arrival, we found the house decorated for our reception, as before described, and in addition, a lighted lamp on each side of the door, ornamented with the flower of the *Areca nut* tree—throwing a feeble light in broad day, with a glorious sun shining brightly! the table was covered with fruit, *pine apples*, *pomegranates*, *oranges*, *plantains*, a species of *melon*, *jambos* and young *cocoa nuts*, the liquid contents of which we found deliciously cool and refreshing. There was likewise honey comb, and very excellent sugar-candy made from toddy drawn from the Jagherry palm, *Caryota urens*. I had often before seen what is called Jagherry, but it always appeared to me a very coarse apology for coarse brown sugar—this was really excellent sugar-candy, such as I have often bought in my younger days; it is pepared by simply boiling the toddy, after straining it through a cloth, until it becomes the consistency of syrup; it is then tied up in the spatha which covers the flower of the *areca nut*, (and which almost surround the tree)* and left to dry in the sun, when most of it crystallizes, and what remains liquid is poured off.

"27*th.*—We remained here, having again to change our people, who never like to go beyond the limits of the district in which they reside. The Coral seemed to have very little authority, and made great difficulty about procuring us Coolies. As he could speak no English, and we no Cingalese, we should have been at some loss how to get on, had not our friend the Modlear, who understood English tolerably, accom-

* Each parcel of flowers has a separate spatha.

panied us to this place and acted as interpreter. Our sitting room being open on all sides, we were surrounded by *gazers* all day. In the evening we took a walk, which we wished to prolong, finding the scenery very pretty, and the vegetation highly various; but we were told it was not safe to venture far from the village at that hour, on account of elephants, which are very numerous in the neighbourhood, and attracted to the immediate vicinity of the village by a large sheet of water—not exactly a lake, but what on the continent of India is termed a jeel. The proof of elephants being numerous was evident from the great number of stages fixed in the trees, from whence the people guard their fields at night. On hearing the approach of the *enemy*, by the crashing of the jungle as they draw near, they descend from the trees, and proceed with lighted torches in the direction from whence the sound proceeds; the elephants no sooner see the lights than they take fright and retreat to the jungle, otherwise the paddy-fields would be totally destroyed. In this neighbourhood, lieutenant G., 90 Light infantry, had shot seven or eight elephants a few days before we were here: he had explored his way up from Tangulle I believe, and expected to have met us here.

"28*th*. Set off at 6 in the morning, first half-hour through pretty lanes, with many plants forming hedges on each side; the country appears to have been much more cultivated formerly than it is at present, there seem to have been good roads also, now mostly overgrown by different plants particularly a *Calanchae*, introduced with care a few years ago, and now, a most troublesome weed not to be got rid of. After passing through some fine paddy-fields, the country became more rugged, and having crossed a small stream, we commenced our first steep ascent, which was certainly rather laborious, though my Coolies surmounted it easily. The baggage people have much harder work; as I have always eight men for my palankeen when the stage is mountainous, and six when level, the palankeen is very small and light, so that it is no load for them at all. We had been prepared to meet with great

difficulties on this day's journey, some of the people asserting that it would be quite impossible to get the poney along: but, as is generally the case when the expectation is raised, the reality seldom comes up to it; and having pictured to ourselves something tremendous, we were agreeably surprised to meet with little or no difficulty, and to get to the summit of our most formidable ascent, by a little after 9. Here we had breakfast, and allowed our people a few hours' rest.

"The top of this mountain, called Koombooroogaméhella, seems to be flat for a considerable extent, and cultivated. *Convolvulaceæ* again appeared in this day's journey; I remarked at least six different species—and on the summit of the mountain, where the ground had been cultivated, saw a very handsome rose-coloured *Urena*, which I had before noticed in similar situations, on the tops of hills, which had been under cultivation; the scenery as we ascended was exceedingly varied and beautiful. We were preceded this morning by our *Musicians*. This custom, though it seems ridiculous to us, has its origin in reason, and expediency—having an opposite effect from the strains of Orpheus, alarming, and scaring away, instead of attracting, the "savage beast"—proving that the elephants have a good musical ear, and cannot bear the approach of Cingalese tomtoms and pipes, the most discordant of all noises.

"The descent of Koombooroogaméhella we found much longer, more difficult, and fatiguing than the ascent. It was near 2 P. M., before we arrived at Tambegamowe a very short distance from the bottom of the mountain, where we were to halt for the rest of the day. Soon after commencing the descent we had a most splendid view of Adam's Peak and the surrounding country.

"Tambegamowe affords the most disagreeable quarters we have yet met with, small, dark, hot, and dirty. The headman's wife requested permission to pay her respects to me, or, in other words, to gratify her curiosity, never having seen a European female before. She came with a crowd of other

women, who, I hope, will not conclude that *all* English women are old, because the only one they have seen, unluckily happens to be so. On our rugged route to-day Col.-W.'s poney lost a shoe, and he began to fear he would be under the necessity of walking all the way to Balengoelde, but fortunately, the horsekeeper had picked up the shoe, and we contrived to get it fixed on again tolerably well. Having so often mentioned our *band*, I must attempt to describe the instruments of which it consisted.

"Three long narrow drums, slung across the chest, and beat at both ends, by the hands of the performers, who wear on the left wrist two loose brass *bungles* or bracelets, which, striking together by the motion of the hand in beating the drum, make a loud ringing accompaniment; *one* broader and shorter drum, carried in the same manner, struck on one end by a stick, and on the other by the hand; a pair of small drums fastened together, and beat on one end only, by the hands of the performers; a kind of pipe which I cannot well describe, but which makes a very loud and discordant noise, two of these wind-instruments, I think completed our musical party; but at Tambegamowe it was joined with two dancers, who capered about for my amusement while I was arranging myself comfortably in my Palkee, and at every halt on the road resumed their exertions. They certainly could not be said 'to trip it on the *light* fantastic toe,' for their legs were loaded from the ankle nearly to the knee, with numerous rows of small brass bells, which of course caused a loud jingling when they danced, and made the people look as if they had got Elephantiasis. On leaving the village, we passed as usual through paddy-fields, and (after crossing the river,) for some miles through low jungle, differing, entirely from any we have hitherto seen, the plants being almost all *Limonias*, or at least belonging to the same family, one very handsome, and powerfully fragrant, which I have seen in gardens at Colombo, and thought a plant introduced from China; there may be some specific difference however, were the two plants compared. A species of *Carissa* was also common, and a

new plant which Col. W. could not make out, as we could only find the male flower, the blossom of all these plants being white, and in full flower, spangled the dark green of their foliage in a very remarkable manner. After crossing another river, or perhaps the same at another place, we found a great quantity of the *Vanilla*, formerly got at Cultura, here climbing over very high trees and hanging in festoons from one to another. Mr Nightingale pronounced this the *V. aromatica*, from a drawing of mine which Col. W. showed him. As I have twice sent copies of this drawing home, I hope you will soon decide upon it. This day's journey has been mostly through thick jungle and quite level, so that we have seen little of the country over which we have travelled. We crossed another stream on the banks of which we found a Bungalow erected of bomboos and *Talipot* leaves, there being no village in the neighbourhood it was rather hot during day time, but cool at night, and quite water-tight, as we had a heavy shower in the evening which did not penetrate. I amused myself through the day by drawing an *Orchideous* plant, the first we have found in flower, belonging to Lindley's *Ophrydeæ*.

"2*d March*.—Left Waratene at 6 A.M., re-crossed the river, and immediately began to ascend a very long and steep hill; the descent was more rapid, and in some places very steep and rugged. Then followed a long tract of abominable paddy-fields, the most tedious and disagreeable parts of our journey; we crossed another range of hills covered with uninteresting jungle, chiefly the *Croton* which I formerly remarked, and which almost always springs up after the land has been cultivated. I saw nothing new, but a magnificent *Capparis*, with very large white flowers, *C. grandis* I suppose. Our route continued over several ranges of hills from the tops of which the scenery was very fine, the mountains in the distance assuming a variety of picturesque forms. Tree Pada (Adam's Peak) was seen, looking less majestic than usual, from the great height and bold outline of many of the nearer mountains; one particular hill, not far from Ballingodde is wonderfully fine from many points of

view. For the two or three last miles, we travelled through a jungle, consisting entirely of low *Guava* trees, or rather bushes, *Psidium punilum?* The fruit is very delicious, when eaten fresh pulled, having none of the strong taste and smell it acquires when kept.

"It was half-past 10 when we arrived at Ballingodde, at the residence of the first *Adigar*, who received us most hospitably. It seems to be the object of the Kandyans to *bury* their houses in places where they cannot be seen, and from whence they can see nothing. From the upper story of the Adigar's house, nothing was visible but the roofs of the low buildings round it, and the tops of some plantain trees, though situated in a beautiful country. The Coral's house at Madawanwellé was buried exactly in the same manner.

"*Friday the 3d.*—We remained at Ballingodde, and set off with the intention of taking a long walk in the evening, but were soon driven back by a heavy shower and loud peals of thunder. At dinner the Adigar made his appearance, and went through the ceremony of dining with us, everything in the English style. Recommenced our journey early next morning, and crossed a small river by a wooden bridge, and travelled as far as Alentneura, on a broad regularly made road, which, however, was carefully carried over the highest part of every hill in its course, the ascents and descents in some places being quite precipitous. In half an hour we crossed the river Walloway, over which we were ferried, but obliged to swim the poney. At Alentneura, we breakfasted; it seems a populous village, with a large Boodist temple. The scenery between this place and Ballingodde is very pretty; but from hence to Gallegamé, it is quite enchanting, becoming more and more beautiful every step we proceeded, and the variety of plants of all descriptions, trees, shrubs, and flowers, quite endless. I never enjoyed anything more than this day's journey, and only regretted the improbability of my ever travelling over such a delightful route again. We were fortunate enough to get to Gallegamé just before a heavy shower fell. Our habitation here is of the

most airy description, originally built as a temporary accommodation for the governor's party, who last year paid the Adigar a visit from Neuwera Ellia; it is now in a ruinous state, but luckily, we found the roof still good, and contrived to make ourselves very comfortable. On this day's journey we again found the *Hebradendron*, so that there can be no doubt of its being indigenous.

"Next morning we got up early, and walked back on our yesterday's road, as far as the rocky river which we had crossed on a temporary bridge made of branches of trees covered with sods; it was now impassable, the river had risen so much in the night, that our bridge had been almost completely washed away. The scenery about this river, (the Billool-oga,) is very fine; I found our walk back very fatiguing, at least two miles was up hill all the way, and the sun very powerful. I was here again requested to exhibit myself to the *ladies* of the village, as a specimen of my countrywomen. I told them they ought to have seen a *young* friend of mine, who passed this way lately, and who would really have been a good sample; but they assured me they preferred seeing an *old lady*—rather an uncommon fancy. It was some time before I could get rid of my visitors, who seemed much amused with my proceedings, when I commenced drawing a flower which I had picked up in my morning's walk. Our people found one or two *Orchideæ* in blossom, but all terrestrial, and belonging to the tribe *Ophrydeæ*, their flowers small and inconspicuous. I made drawings of most of them, which you will find among those now sent; I had seldom time, however, to make more than an outline while on our journey, and indeed, it was very difficult to accomplish even that, being obliged to sit in an open place where my paper was first blown away, and in an attempt to secure it, my dissected flowers irrecoverably lost, after I had been half an hour employed in picking them carefully to pieces. This was no small trial of patience I can assure you. Here, ten of our Coolies decamped in the night, and for some time it seemed very doubtful whether we could replace them or

not; and as we were assured of our next stage being by far the most difficult of the whole journey, we could not attempt it without our full complement of people. The headman of the village having at last succeeded in procuring substitutes for the runaways, we took an early breakfast, and set off about 8 o'clock.

"We had been fully prepared to find this the most laborious stage in our whole journey, but from the beauty of the scenery, most interesting and gratifying. Our expectations in both respects were fully realized. The road is in many places most precipitous, being carried up the face, and over the summits of mountains, along narrow ridges, and on the edges of precipices; in short, as bad as any thing called *a road*, can well be; but the magnificence of the scenery more than compensates for all the fatigue, and even in some places the risk, (when the governor's party came down, one of the horses fell over a precipice, and was killed on the spot.) Our people from habit I suppose did not seem to think any thing of it; indeed, their insisting on returning the same evening, rather than stay a night at Maha Ellia, is a proof how little they think of the journey. When we set off, the low country towards Hambuntotte and Tangalle, was completely enveloped in dense masses of white cloud, while we were in bright sunshine; but unfortunately, as the sun rose, the clouds seemed to disperse, and following, soon overtook us in the form of mist and fog, occasionally intercepting our view, sometimes dispersing and giving to our wondering eyes scenes of the utmost grandeur and magnificence, which I shall not attempt to describe; at other times, opening partially, and showing as it were, stupendous masses of rock suspended in mid air, apparently detached entirely from all connexion with this lower earth. Again, the fog opened on the side of a hill, when woods and meadows appeared set in a frame of mist, the scene changing gradually as the wreaths of fog rolled over the summit of the mountain, or closed entirely on the view. But I should never have done, were I to attempt to describe the endless variety of those wondrous

scenes, by far the most magnificent I had ever witnessed in Ceylon or elsewhere. I sometimes got out of my vehicle to botanize, sometimes to relieve my Coolies, and sometimes because I thought it was impossible they could carry me in safety. The first mountain we ascended was rich in botanical treasures; the grass was enamelled with the brilliant yellow of the *Ipsea speciosa;* a bright deep lilac *Melastoma*, the plant low and small, with large flowers; two species of *Gerardia*, one with primrose-coloured blossoms, the other pink; the rich blue of the *Chironia trinervis*, with the showy flower of *Hypericum Mysurense;* but to attempt to enumerate them would be vain, both from my own ignorance, and their endless variety. Suffice it to say, we saw very many novelties, and recognised hundreds of old acquaintance; I shall only mention one more, a very beautiful *Orchideous* plant with a rose-coloured flower, which we found in rocky places, where there was a good deal of water, it was quite new to us, and I hope my drawing will enable you to name it. As we continued to ascend, we found the plants to vary; several handsome species of *Impatiens* next attracted us; but I shall never get to the end of our day's journey, if I botanize any more, so I must hasten on. After mounting over rocks and over mountains, quite free from high jungle, so that our view was uninterrupted, we at last entered a thick forest, through which our road lay for a considerable time; here we found many *ferns*, one, apparently, with the *sori* on the upper surface of the *frond*. On emerging from the wood, we ascended a tremendously steep acclivity from whence the view was superb, differing from all we have seen to-day by its great extent. I am not a general admirer of very extensive views, as they are frequently wanting in the foreground and near objects; but this, obtained through an opening in the mountains, had the advantage of bold rocks, fine trees, and all that one could wish combined. We had here attained our greatest elevation; for the last four miles the road is level, winding round grassy knolls, generally crowned with wood, and following the course of the Billooloya, which we

crossed and recrossed several times, before we got to our resting-place. We at last gained sight of the Bungalow, lately erected on the plains of Maha Ellia, (called by the English, in compliment to the governor, the Horton plains.) As we had been under some apprehension that we might not find any shelter at all in this cold region, the appearance of anything in the form of a house was a great comfort to us, more especially as we also found tolerable cover for our servants. We arrived about 3 P.M., and as our Coolies were very anxious to return immediately, and some of them had only engaged to bring us here, we foolishly (as we afterwards found) allowed them all to go. After paying them, I began to think of settling ourselves for the night, which we found difficult to manage, with the least hope of comfort; for though we were thankful to obtain any kind of shelter, yet it was no easy matter to keep ourselves warm in this *vegetable edifice*, for we found the house composed of wood and grass, which hardly excluded the sharp night-air. However, we crept into the snuggest corner we could discover, spread mats, tarpaulings, &c., on the damp ground, clothed ourselves in warm garments, and made ourselves as comfortable as circumstances would admit. Having despatched a messenger to Newera Ellia for supplies and Coolies, we walked about to warm ourselves till dinner-time, after which we had a glass of hot negus, and got to bed early, after all the fatigue of the day. We found the night so cold, that notwithstanding our weariness we could not sleep, and when dressed, I was glad to go and sit in the sunshine for warmth. We regretted much having not brought a thermometer with us. The house being dark, I was obliged to place my drawing-table quite in the door-way, where my fingers soon became powerless from cold, and I was frequently compelled to have recourse to my former expedient of sitting where the sun shone brightest. This Bungalow, being placed in the forest on the edge of the plain, derives little benefit from the rays of the sun, but the winds are so strong on this elevated region, that the shelter of the woods is quite necessary; there seems quite a trial of

power between the sun and wind at Maha Ellia, in which, I think, the wind conquered; at least I could never feel warm, even in Sol's brightest rays, if exposed at the same time to the chill blast. But when it is calm the climate is most delightful, and the place every way superior to the plain of Newera Ellia. The extent of level ground is much greater; but it is not one uninterrupted plain, low hills intersect it in many parts, between which lies a succession of extensive plains branching off in every direction. The heights are all wooded, the levels covered with grass of a better description than at Newera Ellia, and free from swamp. A pretty stream (the Billooloya, in its infant state) runs through this most extensive plain, and the wooded hills afford, at their bases, delightful sheltered sites for houses. I fixed on one, should I ever build at Maha Ellia, at the extremity of the great plain, commanding the most beautiful view of Adam's Peak and all the varied scenery around, that I have ever beheld; altogether it is a pity I think that this place had not been selected as the convalescent station, in place of Newera Ellia; but I believe it was not known to the English. Newera Ellia was discovered by chance, and was fixed on at once, without any survey being made of the neighbouring country; to the natives it must have been well known from the name they had given it, *Maha Ellia*, meaning, I am told, the Great Plain. We walked in the evening, but could not venture far from the house for fear of elephants, which are very numerous; indeed their traces are to be seen every where, and recent foot-marks close to the Bungalow; but, although I have now travelled a good deal in Ceylon, I have never yet encountered these giants of the forest in their wild state.

"8*th*.—By additional clothing, and greater attention to fixing up our doors and windows, we contrived to make ourselves more comfortable last night. Our messenger returned from Newera Ellia, with some supplies, but without a hope of our getting Coolies from thence. We had, however, another chance, Col. W. having written to the government agent in Owva, begging of him to use his influence in our behalf.

Spent the day as yesterday, in drawing and walking, the people having brought in a good many plants, the examining which afforded Col. W. amusement; he also took a ride over the plain, which can be traversed in all directions, without fear of being swamped, a common occurrence at Newera Ellia.

"9*th*.—We spent another day at Maha Ellia, much in the same manner with the two former, and on the 10th, by the kind assistance of Captain R., the agent in Owva, we were enabled to proceed towards Newera Ellia; the distance must be full twenty miles from the time we took to accomplish the journey, although we had been told it was but fifteen; the road we found good, and the scenery rather pretty, until we got into a *Nilloo* jungle, which I was two hours in passing through and in which nothing is to be seen but the straight stems of the plants growing close together, to the height of from twelve to twenty feet, without branches, and without foliage, till near the top, which is crowned with large leaves excluding light, and almost air, from the soil below, which is consequently barren of every thing but a few common *ferns;* this plant belongs to the *Acanthaceæ*, and is twelve, or some say fifteen years of coming to maturity, when it flowers, ripens its fruit and dies. It covers miles of country, and may be seen of different ages and heights; the young plant, for the first year or two, springing up under the bare dry stems of the parent shrub, which continue erect for that time.—Plants of different ages, however, are never seen together; for a great extent they appear, when young, like a luxuriant turnep field,—in a mile or two you find them of greater height, the growth of a previous season, but again all evidently of the same age; the first year after the plant has flowered, the jungle presents nothing for acres together, but the straight dead stem of the plant, with the branches which crowned its summit, decayed and broken, and strewed on the ground below. It is curious that we have never been fortunate enough to find this plant in flower, though we have seen it of all stages of growth. There are a great many plants, to which

the natives give the name of *Nilloo*—all, I believe, belonging to the *Acanthaceæ*—some are said to flower in three years, some in five—they have all distinguishing names, to which, *Nilloo* is added; the one I have particularly alluded to, is called *Maha*, or *the great*, Nilloo; when it blossoms, they say the jungle swarms with bees, so much so, that the natives pay a considerable sum to government, for leave to collect the honey and the wax, in the years it is known the Nilloo will flower. This circumstance was told us by the former government agent in Owva, who mentioned the sum he had received on account of government for this permission, which was considerable, though I do not exactly recollect the amount. These Nilloo jungles are, generally, interspersed with stunted-looking trees, but no plant grows under them.

"While we were slowly making our way, by a narrow tortuous path, unable to see a yard to right or left, in front or even above, (for the slender stems of the plant bent and united over our heads,) I could not help sometimes considering, rather seriously, what would be my fate, should we meet an elephant in this narrow way! from which escape must be impossible. The Coolies, of course, would have put me down, that they might shift for themselves, if possible, and who could blame them? My doom was therefore inevitable;—and having come to this conclusion, I tried hard to dismiss the idea from my mind, but it was difficult to summon gayer thoughts, while I continued in this dull monotonous jungle. We got to the end of it at last, and were delighted to find ourselves close to Newera Ellia, and soon came in sight of its comfortable-looking cottages, with the blue smoke curling from the chimney-tops, indicating good cheer and warmth within.—Two miles of excellent road, the whole length of the Newera Ellia plain, were soon traversed, and we were safely deposited at the rest-house, about 5 o'clock P.M.

"Here we remained for ten days, Col. W. collecting and examining plants, and I drawing all the forenoon, walking in the evening, and reading after dinner till bed-time. We found several curious *Balsams*, and some new *Orchideæ*; but

upon the whole, were disappointed in our botanical expectations, as very few plants were in flower, in consequence of several days of continued cold weather, with frosty mornings, which had blighted every thing; even the young shoots of the *Rhododendron* were shrivelled up, as if they had been scorched, and not one of the most common vegetable productions, which generally blossom all the year round, had a single flower on them.

"On the 20th of March, left Newera Ellia; breakfasted with Mr Thomas, half way down the Ramboddé pass, where he is employed in superintending the roads, which they design, if practicable, to make passable for carriages. As it is the present system to expose the road to the influence of the sun all day, they unsparingly cut down every thing for a considerable distance on each side, so that not a plant is now to be found, without dismounting and actually scrambling through the jungle, where formerly we used to discover something new or pretty at every step. The want of shade, too, though it may be good for the road, is disagreeable to the traveller. We got to Ramboddé about half-past 3, I rode, and Col. W. walked all the way. Three very pleasant days we spent at this beautiful spot, occupying ourselves in the same way as we did at Newera Ellia. *Impatiens* and *Orchideæ* were still the subjects of my pencil. Ramboddé is famous for its waterfalls, and therefore, generally, most admired in a wet season. I have seen it when the torrents were rushing furiously over the rocks, the white spray rising again in columns towards the mountain-top, certainly a magnificent spectacle; but at such times the sky is generally lowering and cloudy, giving a sombre character to the scene. The effect of the rising or setting of a brilliant sun is, I think, at this place, still more beautiful. I never saw any thing to equal the effects of light and shadow here, every moment bringing some new and beautiful object into view; the falling waters now glancing in the sun-beam, now softened by the shade; the glowing tints of the splendid foliage, contrasted with the dark rocks, form altogether a most splen-

did and varying landscape, far beyond the power of the pencil to pourtray, or the pen to describe.

"On the 24th we left Ramboddé, with great regret; I prefer the climate there, to the cold of the *Ellias*. There is nothing very remarkable on the road to Phusalawé; for long tracts, the hills are covered either with *Fern*, (all of one species) or *Lemon-grass*,* where the latter has been burnt down, and the young shoots are springing up again; the whole atmosphere is impregnated with its powerful scent, which most people like, but I do not. It reminds me of a perfumer's shop, to which I much prefer the breath of morning. The road, through the forest, is undergoing the same operation as that through the Ramboddé pass, and is now laid bare to a considerable distance on each side; and where we formerly travelled under pleasant shade, tempted by the beauties of the vegetable creation to collect more than we could carry away, we were now glad to hurry over, that we might get out of a scorching sun, reflected from the bare banks on each side: of course, it will not continue long in this state, the banks, at least, will soon be again clothed with verdure, for vegetation is most rapid in this climate. But it is not for the formation of roads alone, that the axe now resounds through the primeval forests of Ceylon; extensive tracts have been lately purchased from government, by speculating individuals, who calculate on making rapid fortunes by the growth of *Coffee*, *Cinnamon*, and other *Spices*. The whole of the forest of Phusalawé is now private property, and is clearing and planting, as fast as the scanty population permits, for I believe the proprietors find great difficulty in procuring labourers in this part of the country.

"We reached the rest-house at Phusalawé about nine,—remained that day and the next, being employed as usual; Col. W. found several new plants, one of which I drew, besides a pretty *Dendrobium* with orange-coloured flowers. On the 26th we proceeded to Gampolla, from thence, next day to Kandy, where we remained till the 30th, and on that day

* *Andropogon Schœnanthus.*

returned to Colombo, by the mail-coach, after a most interesting and agreeable excursion, which we both enjoyed very much, though I fear my account of it may appear tedious to you. Having been written by piecemeal, I had no idea it was so long; but I found I could not abridge it more, without altering the style of it entirely.

"I remain, my Dear Sir,

"Yours faithfully,

"A. W. WALKER.

"*July 6th*, 1837."

XIV.—*On a* White Fossil Powder, *found under a bog in Lincolnshire, composed of the siliceous fragments of microscopic parasitical* Confervæ.—By J. E. Bowman, Esq., F.L.S, &c., &c., &c.

[*With a Figure*, Tab. IX. B.]

It is not much more than three years, since Professor Ehrenberg of Berlin astonished the scientific world by the discovery of animalcules in a fossil state. In the course of his extensive investigations, he found that a soft stone, the *Tripoli* of commerce, long used as fine polishing powder, consisted, almost entirely, of the siliceous skeletons of microscopic animals; which being perfectly preserved, may be examined by the microscope, and compared with living species, with some of which they are identical. This stone or powder is found in such abundance in some countries, that whole mountains are formed of it. He examined specimens from Sweden, from Bohemia, from Tuscany, and from the Isle of France, and ascertained it to be every where composed of countless myriads of the exuviæ, or cases of minute infusorial animalcules: whole races and generations of which must have lived upon the spot when covered with water. In Sweden and Lapland, it is found in a pulverized state resembling flour, and is called *Bergmehl*, or *mountain meal;* in times of scarcity, it is mixed up with grain and the bark of trees to make into bread, and is superstitiously considered

as a seasonable gift of the Great Spirit of the forests. It would appear, indeed, that it has more than an apparent resemblance to meal, for Berzelius found, on analysis, that it contained a small portion of animal matter, though the bulk of it was pure silica.

Another apparently similar powder has more recently been discovered, which stands in the same relation to plants as that of Ehrenberg does to animals. The forms from which, in both, it is derived, are placed at the bottom of the scale of organic life, only one remove from inorganic matter, and where embryo vitality commences; and they constitute together a group, which is the connecting link between the Animal and Vegetable Kingdoms. Some of their forms are so ambiguous, that the acutest naturalists who have studied them most, are still divided and uncertain as to which they essentially belong. The extremities of some show moveable little points, which afterwards change into new individuals; are these ova or gemmæ? And others have been observed to increase by separation; are these polypes, or viviparous vegetables? Many of the species emit an animal smell when burnt, by which it has been inferred they ought to be classed with animals; but this is only negative evidence, for various large *Algæ* of undoubted vegetable origin also produce a similar odour on being burnt to a coal. Wherever the line of separation may be ultimately drawn, (which it probably never can,) they constitute together a transition group, imperceptibly passing upwards on the one hand into the animal, and on the other, into the vegetable kingdom; each successive division in the ascending scale, becoming more and more decidedly stamped with the characters of the one or the other, and in its advance being endowed with a higher and more complex organization. But while just emerging from doubt and obscurity, there are some existing forms which may be safely referred to the animal, and others to the vegetable kingdom, both still retaining the common character of being invested with a siliceous case or envelope, which is indestructible; analogy therefore would lead us to

suppose that similar forms might also be found in the fossil state.

In Silliman's American Journal of Science for October, 1838, Professor Bailey states that he found in the neighbourhood of West Point, State of New York, a deposit of white powder, eight or ten inches in thickness, and probably several hundred square yards in extent, buried about a foot below the surface of a small peat-bog; which, on examination, was almost entirely made up of the siliceous shells of infusorial animalcules, among which were a few fragments of vegetable origin. He also found near the same locality, living infusoria in great abundance in small streams and stagnant pools, and nestling in wet moss on moist rocks; but most abundantly in bunches of Confervæ, which constitute the green slimy matter so abundant in bogs and slow running brooks. They were accompanied by great numbers of minute parasitical Confervæ, by burning off the vegetable matter from which, and examining the ashes with a good microscope, numerous siliceous shells, both of the animalcules and the plants were discovered, and were found to be equally unchanged by fire or acids. Many of the forms of each were observed to be identical with those in the fossil state. The knowledge of these curious facts stimulated scientific men to examine similar depositions wherever they might occur; for it was not yet suspected that any thing of a like nature existed in Great Britain.

In the Magazine of Natural History for July last, 1839, Dr Drummond of Belfast announced the discovery in Ireland, of a very light white earthy substance, found in considerable quantity on lowering the waters of Lough Island Reavey, by the Bann Co., under a covering of about a foot of boggy soil, and in other neighbouring valleys in the recesses of the Morne mountains in the county of Down. He describes the powder, when dry, to be of the whiteness of chalk, but becoming brownish when wet; as light as carbonate of magnesia, which it much resembles, and without any admixture whatever of unorganized matter, or cementing

medium. The specimen he received was a compact mass, and had a coarse and somewhat fibrous fracture, but could easily be pulverized, and when rubbed between the finger and thumb, it had no grittiness, but seemed to be an impalpable powder, and when it was then blown into the air, it floated about almost like wood-ashes. Magnified figures of this powder are given, consisting of six different shapes, but the bulk of it is stated to be long linear spicular bodies, with a small per-centage of others of an oblong or square shape, or oval, or with smaller ends. This powder was not acted upon by nitric, muriatic, or sulphuric acids and was indestructible by fire. Now, it is a well known fact, that many families of vegetables, especially the Gramineæ and Carices, take up a large quantity of silica in a fluid state through their roots, and deposit it in an unorganized shape, within and upon their stems and leaves. In fact, beautiful vegetable skeletons of such plants may be procured by burning away all the carbonaceous matter, after which a complete counterpart of the original structure, as white as snow, is left in the indestructible siliceous framework. It is also known, that silica in considerable abundance enters into the composition of certain tribes of Algæ, Confervæ, &c., and may be seen in their ashes after burning, in an organized and unaltered state. On submitting some minute parasitic plants of these families to a red heat, and afterwards examining them in the microscope, Dr Drummond found that the ashes of one of them, the *Diatoma elongata*, which abounds in a small drain in the neighbourhood of Belfast, consisted of oblong joints precisely similar to the spicular bodies that formed so large a proportion of the Fossil Powder from Lough Island Reavey, and he came to the conclusion, that the latter is composed of the siliceous skeletons of portions of these minute vegetables, and analogous to what had previously been found in several places, both in the Old and New World.

As yet, however, it was not known that this highly curious, though apparently uninteresting powder was to be found in England, and this discovery is due to the researches of Mr

E. W. Binney of Manchester; though from his being unacquainted with the character and structure of the minute and grotesque forms of the tribe of vegetables to which it owes its origin, he was not fully aware of its real nature. He informs me, that so long ago as 1836, being then on a visit in Lincolnshire, he observed a whitish pulverulent substance on the sides of a deep ditch, which he at first took to be lime, but on examination, finding it to be quite different in its properties from that body, he supposed it to be of animal origin. The place where it was found, is a portion of a reclaimed peat-bog about four feet in thickness, lying on the Upper Red Marls, one mile east of the escarpment of Lias limestone, in the valley of the Trent in Blyton Car, near Gainsborough. The peat was in a high state of decomposition, and had been under cultivation for some years. The white substance in question, had been thrown out in widening the ditch, and originally occupied a bed varying in thickness from four to six inches, at the depth of about a foot under the surface of the peat, and extending over an area of several acres of land.

In some places, the powder was mixed with portions of peat; but in others it was quite free from such admixture. When first dug up, it was of a yellowish colour, and in a state of paste; but on becoming dry, it changed to a beautiful white powder, that floated in the atmosphere on the slightest agitation, was tasteless, and bore a great resemblance to calcined carbonate of magnesia. Conceiving that it might be fatty matter in a state of adipocire, he successively treated it with sulphuric, hydrochloric, and nitric acids, and afterwards submitted it to the action of heat, by all which processes it remained unchanged; and he was thence led to believe it was silica in an extremely minute state of subdivision. He had subsequently subjected it, under the action of the blowpipe, to an intense white heat for fifteen minutes, and he had treated it with the carbonates of potash and of soda, and thus formed silicates of these substances. He afterwards learned that a similar substance was found in considerable

abundance near Haxey, in the peat deposit of the neighbouring level of Hatfield Chase, and was informed by the farmers there, that wherever it occurred, the soil above it was very poor and unproductive. This fact is a strong confirmation of its being silica, such soils being proverbially sterile.

In this stage of his knowledge, Mr Binney saw Dr Drummond's account of the Powder from Lough Island Reavey, to which I have referred, and immediately recognised the deposit of Blyton Car to be analogous. Indeed, it is remarkable how closely the two descriptions coincide; and it will be observed, that in both these cases, as well as in that from the United States, the Powder was found *under peat*, and resisted the action of acids and of heat. He shortly afterwards procured a fresh supply from Lincolnshire, and submitted it to several friends; among others, he requested me to examine it closely, and communicate the result. The little acquaintance I had with the obscure, neglected, but pre-eminently beautiful, and extraordinary tribe of the *Confervæ*, showed me on the first inspection of the Powder, the high probability of its connexion with them; and a reference to some specimens in my own herbarium, and to magnified figures of others in the works of Greville, Sowerby, &c., soon convinced me that it was indeed the accumulated remains of myriads of these minute aquatic plants, purified by the decomposition of all their original vegetable matter, and effectually secured from contact with other impurities, by the superincumbent peat. The circumstance of its occurrence between two beds of peat, may, I think, be explained on the supposition of a slight change of level, by which the lowest bed has been submerged, and the water in which the *Confervæ* flourished has remained long enough to allow the present accumulation of their remains. In time, however, the water has been driven off by the increase of the vegetables, which in their decay have formed the upper bed of peat, and covered up the powder. Such changes of level, the result of subterranean movements, are of frequent occurrence, and are familiar to geologists.

As the tribe of plants which compose this department of

our native Flora is not generally known, it may not be amiss briefly to sketch their characters. They are chiefly aquatic, and afford the strongest illustration of the fact, that not a spot on the globe has been left without some visible witness of that Almighty hand which first projected it into space. If the summit of the most barren rock or exposed heath is clothed with lichens and mosses, scarcely visible without a magnifier, the waters also, both salt and fresh, swarm with a vegetation of their own, if possible still more minute; the coral caves and deep recesses of the ocean, the crystal lake and stagnant pool, the rapid and the sluggish stream, the pure and ice-cold rivulet of the Alps, the thermal waters, and even the boiling Geysers of Iceland, are severally provided with plants peculiar to themselves, which would soon perish, if transported into any other temperature or locality. These are the *Algæ*, or *Confervæ*, many of which are conspicuous for the beauty and even splendour of their colours, and so strange and grotesque in form, that they seem to have dropped down from another planet; while each is admirably fitted for its place in the great chain of being, adapted for food to innumerable tribes of creatures in figure as anomalous as themselves, and many of them of direct utility to man, either as food, in medicine, or the arts. Some, which on account of the simplicity of their forms, are placed at the bottom of the vegetable scale, are so minute, as to be invisible to the naked eye, except by the altered appearance they give to other larger species on which they grow in such prodigious numbers. To this division belong those which have furnished the fossil powders now described. Their figure and structure are so unlike ordinary plants, that some of the ablest naturalists have doubted whether they really belong to the vegetable world, and have confessed themselves unable to draw the line of distinction between them and the less highly organized animals, from which, however, they are equally dissimilar. Minute as they are, many of them secrete a hard transparent envelope or shell of pure silex, which, as we have seen, is almost indestructible, and is composed of

innumerable pieces of a square, rhomboidal, or oblong shape, united during life by vegetable matter, but in decay separating at the joints into detached independent portions, the lines of separation being as clear and sharp as though cut by a razor, and showing no trace of their previous union. Dr Greville's botanical character of them is, *that they are generally hyaline or transparent, rigid and fragile, in parallel series or circles, naked or imbedded in a mucous mass or gelatinous frond, and at length separating into definite segments.* I may here observe, that though mostly parasitical and attached to larger species, many of them float loose in the water, in wiry entangled masses or detached little points, not larger than a pin-head, but when magnified, appear like radiated or starry globes. These probably lie at the bottom of the water till the season of fructification, when they rise to the surface for a few weeks, and are so abundant that the fluid seems impregnated with curd or fecula, so as to attract vulgar observation. I have witnessed this singular appearance for several successive seasons about midsummer, in the broad deep lake near Ellesmere in Shropshire, where it is known as the "breaking of the water," as though the lake thus cleansed itself of its slimy extraneous matter. Some similar minute *Conferva* appears annually on the lake of Neufchatel, and attentive observation would probably detect it also in other similar situations; and no doubt but the same causes which deposits the powder under Lough Island Reavey, and Blyton Car, are still in operation in favourable localities. The deposit is still going on in Lough Island Reavey; nor is it an improbable conjecture, that if ever by a slight elevation, the lakes of Ellesmere and Neufchatel come to be drained off, the remains of floating and parasitical *Confervæ* may be found occupying a stratum along their former bottom, covered up by peat or bog moss.

Little more now remains for me than to state the result of my examination of the fossil powder now before us. Though so impalpable as not to be felt between the fingers, and so minute that with an ordinary lens no organization can be

detected, a very high microscopic power shows it to contain a mass of transparent squares or parallelograms of different relative proportions, the areas often plain, but frequently traced with many very delicate parallel lines or streaks, which either cover the entire surface, or only occupy the middle zone in one direction, leaving a broad plain transparent belt on each side. A proportion of the particles is linear and very long, with occasionally a longitudinal division; others of the same width are only one-half, or one-third, or one-fourth the length; and the sides or edges of all, whether squares or parallelograms, are perfectly smooth, straight and uniform, and the corners rectangular and sharp. The bulk of the powder is however composed of irregularly shaped particles with roughish edges and rounded corners, though they are evidently from their texture of the same origin, and are but broken or comminuted fragments which may have passed through the stomachs of fishes, frogs, &c. The perfect particles bear a very close resemblance to minute crystals of various salts, and to a certain extent may, without impropriety, be supposed to be formed in a similar way. Crystallization is a process which acts on and aggregates together by fixed laws, the purer particles or atoms of inorganic matter suspended in fluids, and seems to be the first step by which they are refined, and after farther chemical changes, made capable of passing into an organic form. Therefore, while these atoms are subject to the laws of crystallization, they may be considered as in an intermediate or transition state between inorganic and organic matter; and in this view the siliceous powder now under consideration, may be said to partake of the nature of crystals. The atoms of which it is composed are in fact an essential portion of an organized body in its lowest and simplest state, in which the vital principle has indeed been developed, but has not yet acquired sufficient energy to liberate them from the dominion of the laws of crystallization.

After the evidences I have now brought together, I think the conclusion is irresistible, that this impalpable powder is

Piddlia Africana

a mass of countless myriads of the siliceous skeletons of many generations of minute *Confervæ*, either identical with, or very nearly allied to, those of existing *Diatomaceæ*. The figures of both here given (see TAB. IX. B.), will show their close connexion. The botanist and the geologist may each congratulate himself that these minute particles have thrown new light upon an obscure corner of the wide field of his own researches; for while the former may prove their close alliance with existing vegetables, the latter may claim for them a place in the Fossil Flora, and rank them with the splendid discoveries of Ehrenberg.

J. E. B.

MANCHESTER, *March*, 1840.

XV.—*On a New South-African Genus of Plants, of the Order* THYMELEÆ, *established by the* HONOURABLE W. H. HARVEY.

[*With a Plate*, TAB. X.]

MR HARVEY has done me the favour of communicating to me flowering and fruiting specimens of a plant detected at Port Natal, South Africa, by Lieutenant-Colonel Peddie, of the 72d Regiment, allied to *Aquilaria* and *Gyrinops;* but which has so many of the characteristics of *Daphne*, that he is led to believe that the Order *Aquilarineæ* itself should rather form a section of *Thymeleæ*, in which opinion Mr Arnott seems entirely to accord. Be that as it may, the plant in question constitutes a Genus distinct from any either in *Aquilarineæ*, or in *Thymeleæ*, and to which Mr Harvey has given the name of *Peddiea*, in compliment to its discoverer, who has collected in the same interesting country many other novelties which Mr Harvey is preparing for publication. This Genus may thus be characterized:—

PEDDIEA. *Harvey, mst.*

Perianthium tubulosum superne angustatum inferne subventricosum siccitate sulcatum, limbo 4—5-fido brevi, laci-

niis revolutis, ore omnino nudo. *Stamina* 8—10, intra tubum, biserialiter inserta, 4—5 lobi laciniis opposita, 4—5 iis alterna. *Filamenta* brevissima. *Antheræ* breves, biloculares, loculis antice longitudinaliter dehiscentes. *Ovarium* ovatum, biovulatum, ovulis ex apice pendentibus, basi membrana hypogyna truncata cinctum. *Stylus* elongatus, gracilis, perianthio subduplo brevior. *Stigma* incrassatum, vertici depressum. *Fructus* drupaceus, dipyrenus. *Nuces* semiovatæ, uniloculares, monospermæ. *Semen* exalbuminosum. *Cotyledones* hemisphericæ, carnosæ. *Radicula* supera.—Frutex, *ramis dichotome ramosis, cortice tenuissimo* (*ut in* Daphnide) *tectus.* Folia *subopposita vix petiolata, membranacea, integerrima, glabra.* Pedunculus *terminalis.* Flores *umbellati.*

Peddiea *Africana.*—(Tab. X.).

Hab. Port Natal, South Africa. *Lieut. Col. Peddie.*

The family of *Aquilarineæ* is defined both by Mr Brown and by Mr Arnott (in Lindley's *Nat. System of Botany, ed.* II. *p.* 196), as having a two-valved capsular fruit, with 2 seeds, which constitute the chief distinguishing characters between it and *Thymeleæ.* Mr Arnott, in a letter to Mr Harvey, says, "I consent willingly to let your plant be placed in *Aquilarineæ;* but forming an intermediate point between that Order and *Phaleria*, of Jack, (which has 4 ovules and 2 cells), and *Laghetta*, which has 1 cell and sometimes 2—3 ovules. In the *Aquilarineæ*, I know the fruit is capsular and dehiscent; in your plant it is a berry, or at least succulent, and it may be a drupe, as in *Thymeleæ.* I quite agree however that *Peddiea* is a new genus, at least I have not seen any thing among Drége's plants like it, as far as I have looked over them."

Fig. 1. Flower; *f.* 2. The same laid open, showing the stamens and pistil and hypogynous membrane; *f.* 3. Pistil; *f.* 4. Ovary laid open; *f.* 5. Drupe; *f.* 6. Drupe with part of the pericarp removed, showing the nuts; *f.* 7. One of the nuts; *f.* 8. The same laid open; *f.* 9. Embryo:—more or less *magnified.*

XVI.—*Botanico-Agricultural Account of the protected Sikh States.* *By* M. P. Edgeworth, Esq., *C. S. Masuri.*

[From the *Journal of the Asiatic Society.* No. 81.—Sept., 1838.]

(The following paper, containing an account of the vegetation of a little known district in the northern interior of India, was kindly forwarded to us by Miss Edgeworth. We feel assured that our readers will feel pleasure in perusing the journal of the brother of that accomplished lady.)

"The extensive territory under the *Ambalá* political agency comprises the hill states of *Sirmur*, *Kahlur*, and a portion of the plains principally possessed by Sikh chiefs; bounded by the above states to the north-east, the *Sutlej* to the north and north-west, the *Jumna* to the east, and the *Delhi* territory and *Bhatiana* to the south.

"It is not my intention to treat of the hill Rajpoot principalities, as I am only very partially acquainted with but one of them (*Sirmur*); but solely of the 'protected Sikh states' in the plains.

"This tract of country may be separated into three great divisions, (besides the narrow strip of *khádir* land adjoining the *Jumna* and *Sutlej*) according to their most abundant natural products, viz., the *dakh*, the *bábúl*, and the *phalahi*.

"I. The first of these, or *dakh* tract, extends from the high bank above the *Jumna*, which in most places adjoins the *Shah Nahr*, to the *Linda* river, a small stream not noted in the exceedingly inaccurate maps* of this part of the country, which runs nearly parallel with the *Markhanda* at a distance of two to five miles from it, and ultimately unites with the *Sarasvatí* a little below *Thanesar*. This tract of country is generally high and called *bangar;* which term however is more universally applied to its southern extremity, and not

* "I allude to the large maps published under the style of 'Trigonometrical Survey,' though this part of the country has never been surveyed trigonometrically or otherwise; to give an instance, Kotaha or Syyed ka garhi, is divided into three places, viz., Kotaha, Syyed, and ka garhi !!! at a considerable distance one from the other."

commonly to the more northern and narrow part, except in contra-distinction to the *khádir* in the immediate neighbourhood, to which my present observations more particularly apply, as I have never visited the more southern region. The most abundant natural product is the *dakh*, (*Butea frondosa*,) which springs up wherever the land is not cultivated, and in many places (especially towards *Kaithal* and *Jind*) covers vast tracts of country which might be rendered highly productive.

"The Flora of these jangals presents several features in common with that of the *Dhún*, such as species of *Vitis*, *Dioscorea*, *Gloriosa*, *Asparagus*, *Costus*, and *Zinziber*.

"This tract is intersected by the rivers *Sarasvatí*, *Chitang*, and *Rakshasi* a branch of the latter; from these, canals in all directions formerly existed and in a few instances have been lately re-opened, but they are generally overgrown with jangal. These three streams, as well as a smaller one which joins the *Jumna* near *Buria*, all rise near one another in the high ridge above the *khádir* which skirts the *Sewáliks*, in the neighbourhood of *Chichrauli* and *Biláspur*, and are partially supplied in the upper part of their course from springs; but the water from that source is quickly expended in irrigation and they are mainly dependent on rain. They are all characterised by excessive tortuousness of course, and owing to the great perpendicular depth of their banks, are exceedingly dangerous from sudden floods after heavy rain.

"The soil is, generally speaking, tolerably rich; and in favourable seasons produces very fine crops; but parts are exceedingly poor and scarcely worth the trouble of cultivating.

"The usual crops in the *Kharíf* are *rice*, which is pretty extensively cultivated in lands liable to be overflowed, and, on higher ground, *cotton*, *maize*, *joar*, and a very small quantity of *bajra*, *mandiya*, *kodon*,* and *chini*. *San*, the *Hibis-*

* "It is as well here to remark a mistake I observed in Lieut. Hutton's account of his tour to the *Borenda* pass in your journal; he mentions the

cus cannabinus, is generally sown round cotton or pulse fields, while the beautiful *sani* (*Crotalaria juncea*) is grown in extensive fields by itself. The oil-seeds, *turia* (*Sinapis glauca*) and *til* (*Sesamum*,) both the white and purple-flowered varieties, are sown; the former more sparingly and in richer soils and is cut late in November or early in December; the latter is extensively cultivated both by itself and mixed with various *Phaseoli*, such as *urud*, *motth*, *lubia*, *&c.*, on higher and drier grounds. All these crops suffer severely from the depredations of a hairy caterpillar called *kamli*, of the genus *Sericaria*.

"In the *rabi*, wheat and barley form the principal crops; *gram* not extensively and generally mixed with either of the above; *masur* (*Ervum Lens*) is very little cultivated; *sarson* (*Sinapis dichotoma*) is sown to a considerable extent, generally mixed with barley. The poppy is a valuable but very precarious crop; it is very generally cultivated in rich irrigable lands, and when not destroyed by hail, which is too often the case, amply repays the labour expended on it. The land is ploughed three times, being plentifully watered between each ploughing, before sowing; and subsequently the plant is kept continually irrigated till the fruit is formed. The opium is collected in the usual way, by women and children, an incision being made in the head by a three-pronged instrument. The heads are kept and sold; the seeds afford oil as well as an agreeable food, remarkably refreshing during fatigue and abstinence; with the exception of what is vended in the neighbourhood, the opium is sent to the westward, (where the poppy is not raised,) for the use of the Sikhs, who are immoderately fond of it, and consume immense quantities. Tobacco is not much cultivated.

"II. The *Bábúl* country. This tract extends from the *Markhanda* (the narrow slip between that river and the *Linda* being intermediate in its character), to the high ground

fields of *kodon* in the hills, but erroneously gives it the name of *Paspalum scrobiculatum*, which plant, though called *kodon* in the plains, is not cultivated in the hills: what the hill-men term *kodon* being the *mandiya* of the plains or *Eleusine Coracana*."

between the river called in the map '*Khanpur kí naddí,*' and the most western branch of the *Ghagar*. It is intersected with numerous streams, rising either in the outer range of hills, as the *Ghagar*, *Markhanda*, *Begana*, *Baliala*, *Tangrie*, and *Rhone*, or in the high ridge which separates this tract from the *Subcolline Khadir*, as the *Ombla*, *Charmari* and other nameless streams enjoying the generic names of *chhoa* when depending on rain, or *ogal* when fed by small springs. The soil is generally sandy and salt, which latter characteristic is shown by the abundance of *fras* (*Tamarix Fras*) which will flourish only in such a soil. The *bábúl* or *kikar* (*Acacia Arabica*) is the natural product, everywhere springing up and often forming extensive groves. The general appearance of this tract is pretty, the level of the plains being frequently diversified by gentle slopes towards the numerous rivers and their tributary ravines.

"The horizon is generally bounded by groves of *bábúl* trees, which are also abundantly scattered through the fields. But what gives a peculiar feature to a considerable portion of the country, especially between *Ambálá* and *Patiála*, are the numerous hedge-rows of *fras*, which near the villages often form beautiful shady lanes, reminding one of English scenery. This very useful tree is planted from cuttings about a foot long; they are covered at the top with cow-dung to prevent the moisture from rotting the wood, and are planted in little banks raised along the edges of the field or road, at the first commencement of the rainy season; in a week or two they begin to sprout, and by the following year are frequently six or seven feet high, and in seven or eight years form middling-sized trees. From each cutting there are usually several stems, and as soon as any of these have attained a sufficient size to render them available for small rafters, ploughs or other agricultural implements, they are felled, the smaller ones, if any, being left; if not, the root soon throws out a new crop for a future supply.

"The *Fras* delights especially in sandy and somewhat saline soil, and it is remarkable that in dry weather the outside of

the leaves is always covered with a saline efflorescence invisible to the eye but very perceptible to the taste, but this is not observable in the leaf itself, which is tasteless. Probably in consequence of the quantity of salt in the wood, it cannot be used as fuel in a room, from the intolerable fumes it gives out.

"A great portion of this tract is very low, especially that part between the numerous branches of the *Ghagar*, and is cultivated with rice in the *kharif* and *gram* in the *rabi*. *Joar* is even less cultivated than in the first tract, and *bajra* scarcely ever seen, both being sown principally for the sake of the fodder.

"The rest of the *kharif* crops are the same as those in the first tract, except that *mandiya*, and *til* are not so much cultivated, and I have not observed *kodon* in it at all. In the *rabi*, wheat and barley are the principal crops, but *gram* and *masur* are abundant in the lower lands of stiffer soil. *Sárson* is very abundant either alone or mixed with grain, as is flax, like it cultivated for the sake of its oil. The *Raphanus Raphanistrum*, called *táràmíra*, is also cultivated generally among the stubble of the *cotton* for a coarse oil yielded by it: it is exceedingly hardy and never suffers from the frost which frequently destroys the *sárson* crop.

"*Mehndi* (*Lawsonia inermis*), is cultivated in a few villages by a peculiar caste called **maghs*, in the following manner:

"The seed is soaked in water for three days, then strained

* "This is the only caste who cultivate this crop, and they give the following strange account of their origin: Once upon a time there was a Sarsut brahmin, king of *Mecca* (who was maternal grandfather of MUHAMMAD!) his name was Rája MUKHTASUR. From him sprung SAHARIYA, who with his son SAL was turned out of *Arabia* by HOSSAN and HOSSYN. Thence they migrated to *Pundri*, an island, and thence to *Mahmúdsur* in the *Barara mulk*, W. of *Bhatiana*, where they colonized 17 villages. Thence they were driven forth, and after sundry migrations are now settled in the following places:—1. Chaurira; 2. Irágarh, near Patiála; 3. Yára, near Shahábád; 4. Indri; 5. Thánesar; 6. Deorána, near Ambála; 7. Mustafábád; 8. Sádhoura, in the Sikh states; and Lakhnauti in the *Mozaffarnagar* district."

and again soaked till the radicle begins to sprout. The seed-beds are about three feet wide, and twelve or fourteen long, running from north to south, so that they may be sheltered by hurdles from the prevailing winds (west or east). In each bed about a half seer-pukka, of seed prepared as above, is sown, and it is sufficient to plant from half to two bigas kucha according to the growth.

"After sowing the germinating seeds, they are daily watered in the evening till they sprout above ground, which is generally on the third or fourth day. Sown in Chyt, it is transplanted as soon as there has been a good fall of rain in Asarh or Sráwan into fields, and watered as soon as planted, and subsequently every ten or twelve days as may be found necessary. It is ready for cutting the following Jeth, and again in Mangsir, again in Bysakh, and then in A'san, and so on. After the first annual cutting, it is well manured and watered, but after the autumnal one it is left alone till the *Huli*, when it is again manured to be ready for cutting the following month. Thus treated it will continue to be productive for ten or twelve years.

"When cut, the leaves are beaten off the twigs, and about a pukka mun is produced from a kucha biga, and is sold at the rate of six to fifteen seers a rupee.

"Towards the foot of the hills, *kulti* (*Dolichos uniflorus*), and the *sáwank* (*Panicum frumentaceum*), are moderately cultivated.*

"In both these tracts the Sugar-cane is reared extensively, but in a very careless way. It is sown in March or the end of February, as soon as the frosts have ceased, in large fields, not in lines or with any regularity, and is generally surrounded with a hedge of *ticar*, (*Cajanus bicolor*,) which is sown when the canes are set. The only care taken is to prepare the ground by frequent ploughings and a quantity of manure depending on the supply from the village sweepings and the laziness or activity of the cultivators. On the first fall of rain

* Both of these are extensively grown in the hills.

after the young plants begin to sprout (in the end of March or April) the caked surface of the ground is broken either by means of a wooden mallet or small hoe. The Canes are seldom irrigated, never unless when a small canal (*khál*) from one of the torrents or *ogals*, passes near them and consequently the crop is almost entirely dependent on the rains. It is seldom fit for cutting before the end of December, by which time the frost sets in and materially deteriorates the quality of the juice, often even entirely destroying the cane and rendering it useless for any thing but indifferent fodder for the cattle and bad seed for the ensuing year. The cane is even in the best years very poor, and seldom is more than six or seven feet long and three fingers thick; but as the very worst is always kept for seed it is not surprizing that it should have deteriorated. The only wonder is, that it should be considered worth the trouble of cultivating at all in such a way. The cane is cut from the field by sickles and carried entire to the *kolú* or sugar-mill, which is generally situated in the *gohar* or space surrounding the village, (I have here never observed it at a distance from the village as is usual in some parts of the country, except when a river intervenes,) there it is chopped into little bits and pressed in the *kolú;* the mash from which the juice has been expressed, with the leaves, being used as fuel to heat the sugar-boilers. The village cattle are allowed however to help themselves *ad libitum* from the heap. The tall column of dark smoke from the *kolús* with the delicious fragrance of the boiling juice, greet one in almost every village, from the end of December to the middle of February, by which time the work is generally quite over, though sometimes it is continued till late in March, when the crop has been unusually abundant.

"In garden-fields near town, species of the *Cucurbitaceæ* and *Arums*, with the *sweet-potatoe* and *baigan*, *capsicum*, *methi* (*Trigonella fœnum græcum*) and *radish* (both as a vegetable made of the young pods and for its oil) are generally cultivated.

"The best *Grasses* in this region are, after the *dhub* grass, which is abundant, the *dhaman* (*Cenchri* and *Penniseti sp.*) the *palwán* (*Andropogon pertusum, Bladhii* and *scandens*) from the jangals, and from the fields in the rains the annual species called *jangli chini* and *sawank, Panicum Colonum, brizoides, hirsutum*, &c. are cut in quantities for the cattle. The large *birs*, or preserves for hay kept by the Sikh chiefs, consist chiefly of the spear-grass (*Andropogon contortum*) with the *palwán* and *dhaman*, and the coarser kinds, *Poa cristata, Andropogon muricatum* (*dhabri* and *senth*) with the coarser *Sacchara*, cover considerable tracts in the *dhak* region and are useful for thatching. The small *Perotis latifolia* and *Imperata cylindrica* form the first coating to those sandy channels of torrents deserted by the stream which are not unfrequent here, but they are of little value and only used when no other grass is procurable. The *bavú*, a species of *Andropogon*, is considered poisonous.

" The population of these two tracts is mostly Hindu, but among the the zemindars and lower castes there is a considerable sprinkling of Musalmáns, Rajpúts, both Hindu and Musalmán, but principally the latter, and Jats who are the commonest classes among the zemindars; but Rors, a caste I believe peculiar to this part of India, are not unfrequent among the cultivators. Musalmán *málís* are the best. The Sikh persuasion is not common among the Jat zemindars, but confined to the invading chiefs from the other side of the *Sutlej;* through it is not unusual for sweepers and chamars to adopt that faith under the name of Rangrethas and Rámdásias. About one-third of the kahars are Musalmáns, which proportion becomes larger as we advance westward towards *Lodihana* and the *Panjáb.* A Musalmán tribe, *Gagra*, replaces the sweeper caste in the charge of leeches.

" III. The *Phalahi* tract. This, extending westward from my second division, is bounded on the north by the *Sutlej* low land or *Bhet;* to the south by *Bhatiana;* while towards the west I am not acquainted with its limits or the nature of the

countries that succeed it (if different) towards *Firozpur*. It may be considered under two great subdivisions, the *Phalahi* proper and the *Jhand*.

"In the first of these water is found tolerably near the surface (30 to 80 feet), so that wells for irrigation are abundant; in drawing water the lao or bag-pulley and inclined plane is in almost exclusive use, the Persian wheel or *harat* being very seldom seen, and the depth of the water from the surface entirely precluding the use of the *dhenki* which is not rare in the preceding tracts.

"The *phalahi*, *Acacia modesta*, WALL., from which I have distinguished this tract, is a small tree about the same size as the *bábúl*, but quite different in appearance, being very scraggy and armed all over with sharp hooked prickles. It is deciduous, and when the leaves first appear in March remarkably beautiful, the delicate foliage being of the most brilliant light green and set off by the bunches of long cylindrical spikes of white flowers diffusing a delightful perfume through the air; but its beauty is very transitory, the flowers soon fade and the leaves assume a dreary glaucous hue and fall early in winter, leaving the tree covered with the compressed yellowish pods. The wood is very hard and heavy, of a dark brown colour, and is much used for a variety of economical purposes. It grows abundantly in all waste places. In this tract the *Chamror*, *Ehretia lævis*, again appears, being abundant at the foot of the Sewaliks but very rare in the *bábúl* tract; it also is much valued for the hardness of its wood.

"Sugar-cane is only cultivated in the most northern part of this tract; but where grown is eminently successful, being reared with far more care than in those parts that I have previously mentioned, and kept constantly irrigated. The juice is expressed in the *kulhari* or roller sugar-mill, of which I formerly sent a description to the Agricultural Society.

"Cotton is also extensively grown, in two ways; either as a rain crop, as in the before mentioned tracts, or it is sown in April and receives moderate irrigation during the hot weather

under this treatment it attains a much larger size than is common under the former method.

"The irrigated wheat and barley are particularly luxuriant, and in good seasons the grain particularly fine; it is frequently sown as early as August or September so as to be in flower by December, but the fruit then formed is generally destroyed by the hard frosts, and in seasons of drought the white ants commit devastation, laying waste whole fields by devouring the roots of the plants; rats also do great injury to this crop, burrowing in the sandy hillocks so plentifully interspersed among them and denuding the margin of the fields.

"Mustard is also cultivated a good deal, and poppy sparingly and only for its oil, not for opium. *Masur* I have never seen in this tract.

"Rice is only grown in that part of this tract bordering on the *bábúl* region, and if ripe sufficiently early, is succeeded by a crop of *gram* in the same ground.

"The usual *kharíf* crops are *bajra* and *joar* and maize, all of which grow most luxuriantly and to an immense height.

"The southern portion of this division which I have designated the *Jhand* tract, is termed by the natives *Malwa*, whence that appellation to the Sikh chiefs of families from the south of the *Sutlej* in contra-distinction to the *Mànjha* and *Doab Sikhs* or invaders from the other side. It is also named *Chowhára*, as distinguished from the *Tihára*, or lower part of the upper division just described; in consequence of only one-fourth of the gross produce being demandable as the government share, while one-third is claimed in the former and two-fifths in the remaining portion of this and the two preceding tracts, therefore termed *Pachdie*.

"What I have just remarked regarding the luxuriance of the *gram* and *kharif* crops, holds good also with regard to this division when the rains are tolerably plentiful. But the wheat is generally poor, owing to the very sandy nature of the soil. Here irrigation is impracticable, because of the great distance of the water from the surface, varying from 100 to 300 feet. In many villages there is only one, in some

not even a single well, therefore not only the cattle but even the inhabitants very much depend on ponds (*tobas*) for their support. In dry seasons villages are often temporarily abandoned in consequence of the failure of water. Therefore it is a custom that those who take water out of a pond pay for it by digging and carrying out a basket-full of earth for every pot they fill with water, so that the cavity is gradually enlarged and deepened.

"The appearance of this part of the country is highly peculiar. The fields are as it were basins surrounded by long low rolling hillocks of dry sand, either quite bare or clothed with a peculiar vegetation, and are almost universally surrounded by high thick hedges to protect them from the deer; these fences are made of dry thorns heaped loosely together, generally running along the summits of the sandhills, and between them lie the narrow roads barely wide enough for a hackery to pass.

"The vegetation on these sandhills consists principally of a species of *Artemisia* of a most delicious fragrance, and an aromatic species of *Andropogon* resembling *A. Twarancusa.* (Is either of these, or which of them is, the *Nardus* of Arrian?)

"This *Andropogon* is much liked by cattle, and is said to communicate its peculiar flavour to the milk. Besides it there are species of *Cenchrus* and *Pennisetum*, one of which is a most disagreeable torment to walkers, the sharp recurved hooks of its involucre fastening to one's clothes and even to the skin; its seed however sometimes is used as food in times of great scarcity. The leaves both of this species and of two or three others which are indifferently termed *dhaman* afford excellent fodder and are the principal grass for horses, instead of the *dhub*, which is very rare. The *madar*,* *Calotropis Hamil-*

* "This is remarkable for bearing on its roots a curious parasitical species of *Orobanche*, with very thick stalks from one to four inches in diameter, full of almost pure water, which it must have elaborated from the milky juice of the *madar*, and derived from sandhills so dry that it is difficult to believe that so much liquid could have been procured from them; and

tonii, with *Cucumis pseudo-colocynthis* and a species of *Momordica*, also luxuriate on those barren heaps; together with a *Clerodendron*, the wood of which is used for obtaining fire by friction; and two kinds of *Zizyphus*, *Z. jujuba*, and another, peculiar I believe to this tract of country, with smooth glossy leaves and globular purple fruit.

"The most abundant thorn however is the *Jhand*, *Prosopis spicigera*,* which covers barren spots as the *Zizyphus* does in other parts of India, as a low shrub; but it is also met with as a small tree mixed with the *phalahi* and *rerul* (I believe *Acacia leucophæa*), which last, as well as the *Jhand*, are utterly useless except for fuel.

"The *dhak (Butea frondosa)* and the *hins (Capparis sepiaria)* are almost unknown, while *Capparis aphylla* grows to the size of a small tree, and in the month of April its scarlet flowers have a showy appearance mixed with the white blossoms of the *phalahi*. The *rahere (Bignonia undulata)* is found not uncommonly and is very brilliant when in flower: this, with a small liliaceous plant, is a curious instance of plants from the Sewalik hills reappearing in so very dissimilar an habitat.

"Of large trees the *peepul* is the only one of usual occurrence: sometimes the *Tamarix Fras*, or *Pharmí*, as it is named in this part of the country, is found of a considerable size. The *sissu* extends even to the borders of the desert. *Sirris* is seldom to be seen; *mangoe*, or *jamun* never. The *Nim* is very rarely met with, only near some Musalmán saint's tomb.

"In the most south-westerly part of this tract bordering

what is more remarkable is, that this parasite is only produced where the *madar* grows on the very driest sandhills and solely in this portion of the country."

* "When I first met this as a shrub, I was unwilling to consider it as the *Prosopis*, on account of its large *ovate stipules*, that tree being described as exstipulate, but I have subsequently found stipules on the young branches of the full-sized tree, though they are smaller in proportion to the leaf than in the shrub; besides the prickles are much more numerous on the shrub than on the tree."

the desert, a considerable quantity of alkali is manufactured from a species of *Salsola** and forms a considerable article of commerce under the name of *sajji.*

"The population of the third tract differs very much from that of the former ones. In the more northern parts the zemindars are mostly Musalmán Rajpúts, with few Jats among them; but as we come southward the proportion gradually changes, till in the *Tihara* a Musalmán is scarcely to be found and the zemindars are almost universally Jats and of the Sikh persuasion; in that part of the country also the Kahar or bearer caste disappears, and among the lower people the sweepers, assuming the title of Rangrethas, are the most numerous.

"Lastly, a few words on the two strips of land bordering the *Jumna* and the *Sutlej.*

"The *Khadir* of the former may be considered as upper and lower; the upper, contained within the branches of the *Jumna* meeting near *Rajghat*, is almost entirely populated by Goojurs. The soil is cold, moist and sandy; as may easily be imagined possession is most precarious, these upper branches of the river constantly changing their course.— An old tree is therefore seldom to be seen, or a pukka house; generally grass-sheds constitute the only habitations, because the sandy soil will not bind to form mud walls, but is washed to pieces by the first rain; thus fires are very frequent in the hot weather.

"The crops are the same as in my first division, exclusive of those which I mentioned as peculiar to the higher grounds, and they only succeed in years when elsewhere there is a failure; with moderate rain, this whole country, reticulated as it is with channels of the *Jumna*, is overflowed, and it is but in very dry seasons that the crops succeed, as in 1837, when they were most luxuriant.

* "It is a curious circumstance that I found a species of *Salsola* near *Ambalá* growing in a single salt-pan, and not another could be seen any where in the neighbourhood for miles, though I searched every salt-pan for it."

"The lower part of the *Khadir* is only intersected by a few channels of old streams now used as escapes from the *Delhi* canal; this portion is less liable to flooding, and consequently in general bears middling crops. *Gram* is seldom or never sown in it, and *masur* replaces it.

"The '*Bhet*' of the *Sutlej* differs from the *Khadir* of the *Jumna* by being yet more barren. (The upper part of this Bhet I have not seen, and the lower part is nearly entirely covered with thick grass jangal, the haunt of wild beasts, similar to that in the *Gangetic Khadir*.)

"The sand of the *Sutlej* is much darker in colour, and with far larger flakes of mica than that brought down by the *Jumna*, and these larger micaceous particles are equally observable throughout the whole of the *phalahi* tract, while the *bábúl* and *dhák* regions partake of the Jumnatic character.

"Throughout the whole of this territory I have never seen the *matar* of Bengal (*Lathyrus sativus*) cultivated, but it is constantly to be found as a weed mixed with pulse or corn.

"The *arhar* (*Cajanus flavus*) is never cultivated by itself, but the variety *C. bicolor* or *ticar* is sown round sugar-cane fields as before mentioned, and is cultivated in the hills under the name of *kúi*, which leads me to favour the considering them as two distinct species and not merely varieties.

"I had hoped to have been able to give a more full account; but being removed rather suddenly, I have been unable to complete some inquiries I was previously making, and therefore send this, imperfect though it be."

APPENDIX.

"Abstract of Herbarium collected in the Sikh States, exclusive of plants found only in the immediate neighbourhood of or on the Sewalik range.

Polypetalæ.	Total	Cult.		Total	Cult.
Ranunculaceæ,	3	1	Nelumbonaceæ,	1	0
Papaveraceæ,	3	2	Umbelliferæ,	9	6
Nymphæaceæ,	2	0	Vitaceæ,	3	1
			Onagrarieæ,	5	0

	Total	Cult.
Combretaceæ,	1	1
Myrtaceæ,	2	2
Loranthaceæ,	1	0
Cucurbitaceæ,	17	0
Ficoideæ,	3	0
Cruciatæ,	11	6
Capparideæ,	6	1
Resedaceæ,	1	0
Violarieæ,	1	0
Samydaceæ,	2	0
Moringaceæ,	1	1
Flacourtianeæ,	1	0
Sapindaceæ,	1	0
Polygaleæ,	2	0
Elatineæ,	2	0
Lineæ,	1	1
Sterculiaceæ,	2	0
Malvaceæ,	15	4
Tiliaceæ,	10	1
Lythrarieæ,	8	1
Meliaceæ,	3	3
Cedrelaceæ,	1	1
Aurantiacæ,	4	3
Rhamneæ,	3	1
Euphorbiaceæ,	23	1
Celastrineæ,	1	0
Portulaceæ,	5	0
Sileneæ,	3	1
Alsineæ,	2	0
Tamariscineæ,	2	1
Illecebreæ,	3	0
Rutaceæ,	1	0
Zygophyllaceæ,	2	0
Balsamineæ,	1	1
Oxalideæ,	2	1
Rosaceæ,	10	8
viz. Pomeæ, 3		
Amygdalineæ, 3		
Potentilleæ, 2		
Roseæ, 2		
Fabaceæ, (Leguminosæ,)	88	26
viz. Genisteæ, 8 (1.)		
Trifolieæ, 9 (3.)		
Clitorieæ, 9 (2.)		
Galegeæ, 3 1.		
Astragaleæ, 2		
Hedysareæ, 14		
Vicieæ, 8 2.		
Phaseoleæ, 1 7.		
Dalbergieæ, 3 2.		
Mimoseæ, 9 2.		
Cassieæ, 12 6.		
Anacardiaceæ,	2	2
Total Polypetalæ,	270	88

	Total	Cult.
Incompletæ.		
Urticeæ,	10	3
Ceratophylleæ,	1	0
Myriceæ,	1	1
Salicineæ,	3	2
Plataneæ,	1	1
Amaranthaceæ,	14	5
Chenopodiaceæ,	9	4
Phytolacceæ,	1	0
Polygonaceæ,	9	0
Nyctagineæ,	3	1
Menispermaceæ,	2	0
Total,	54	17
Monopetalæ.		
Primulaceæ,	2	0
Sapotaceæ,	3	3
Ebenaceæ,	1	0
Cuscutaceæ,	1	1
Convolvulaceæ,	15	2
Hydroleaceæ,	1	0
Campanulaceæ,	1	0
Sphenocleaceæ,	1	0
Cinchonaceæ,	10	1
Galiaceæ,	1	0
Cichoraceæ,	9	2
Astereæ,	33	4
viz. Vernoniaceæ, 4		
Asteroideæ, 15		
Senecionideæ, 14 (4.)		
Cynareæ,	9	3
Plantagineæ,	2	1
Salvadoraceæ,	1	0
Plumbagineæ,	1	0
Cordiaceæ,	2	2

	Total	Cult.
Ehretiaceæ,	6	0
Boragineæ,	4	0
Labiatæ,	12	3
Verbenaceæ,	8	1
Bignoniaceæ,	1	0
Acanthaceæ,	22	4
Lentibularieæ,	3	0
Orobancheæ,	2	0
Scrophularieæ,	15	0
Solanaceæ,	12	6
Gentianeæ,	4	0
Apocyneæ,	7	2
Asclepiadeæ,	4	0
Jasmineæ,	5	3
Total,	198	25

Gymnospermæ.

Gnetaceæ,	1	0
Equisetaceæ,	1	0
Total,	2	0

Endogenæ.

Zinziberaceæ,	2	0
Marantaceæ,	2	2
Musaceæ,	1	1
Amaryllideæ,	4	4
Irideæ,	2	2
Hydrocharideæ,	1	0
Orchideæ,	2	0
Palmaceæ,	1	0
Liliaceæ,	9	4
viz. Tulipeæ, 2		
Hemerocallideæ, 2 (2.)		
Scilleæ, 2 (2.)		
Anthericeæ, 1		
Asparageæ, 1		
Aloineæ, 1		
Commelinaceæ,	4	0
Butomaceæ,	1	0
Alismaceæ,	5	0
Junceæ,	1	0
Dioscoreæ,	1	0
Aroideæ,	3	2
Typhaceæ,	2	0
Naiadeæ,	4	0

	Total	Cult.
Eriocauloneæ,	1	0
Cyperaceæ,	35	0
viz. Cypereæ, 17		
Scirpeæ, 17		
Cariceæ, 1		
Gramineæ,	112	0
viz.		
Phalarideæ,	1	0
Paniceæ,	42	4
Saccharineæ,	19	3
Rottbollieæ,	3	0
Olyreæ,	4	1
Phleoideæ,	1	0
Agrostideæ,	7	0
Stipeæ,	3	0
Oryzeæ,	2	1
Chlorideæ,	8	1
Avenaceæ,	2	1
Arundinaceæ,	2	0
Triticeæ,	4	2
Festuceæ,	12	0
Bambuseæ,	2	2
Total, Endogenæ,	193	30

Acrogenæ.

Ophioglosseæ,	1	0
Polypodiaceæ,	3	0
Characeæ,	1	0
Marsileaceæ,	1	0
Total,	6	0

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	wild.	culted.	Total.
Polypetalæ,	182	88	270
Incompletæ,	37	17	54
Monopetalæ,	173	25	198
Gymnospermæ,	2	0	2
Endogenæ,	163	30	193
Acrogenæ,	6	0	6
Total,	563	160	743

Out of these the following are peculiar to the *Phalahi* and *Jhand* tract.

Farsetia Hamiltonii.	Plantago, sp.
Reseda oligandra, (mihi.)	Euphorbia, sp.
Bergia odorata, (mihi.)	Ephedra, sp.
Malva Malwensis, (mihi.)	Boraginearum, sp. 1.
Fagonia Mysorensis?	Heliotropearum, sp. 2.
Zizyphus, sp.	Acanthacearum, sp. 1.
Crotalaria arida, (Royle)?	Astragali, sp. 2.
Lotearum, sp.	Orobanche Calatropidis.

And peculiar to the *Khadir* and *Bhet*, are the following remarkable European forms:—

Viola Patrinii, (?)	Ajuga decumbens.
Viciarum? sp.	Butomus umbellatus.
Lotus corniculatus.	Alisma, sp.
Rubus distans.	Ophioglossum, sp.
Erythræa, sp.	

I subjoin a description of such species as I believe to be new.

Reseda oligandra, (mihi.)

Herba glauca ramosa, foliis linearibus acutis papillosis, ramulis axillaribus, stipulis 2 parvulis dentiformibus adnatis ad basin foliorum; spicis longissimis terminalibus, rachi striata, floribus sub-distantibus solitariis sessilibus, bracteis parvis solitariis calyculatis sepalis conformibus, calyce tetra sepalo, sepalis lanceolatis papilloso-marginatis, petala subæquantibus, ovario brevioribus. Petalis duobus oblique lanceolatis, margine interiore subrecto exteriore v. obliquo v. 1-lobato, vel duobus in unum trilobum coalitis, inter duo sepala superiora sitis, concoloribus (albis) vel ad apicem subglandulosis; staminibus sæpius 3, basi coalitis ante petala sitis, vel 5 (v. 4 uno v. altero deficiente) quorum 3 coalita 2 lateralia libera sepalis superioribus opponuntur; antheris geminis.

Disco *nullo* nisi basin staminum sub-dilatatorum intelligis.

Pistillo ad latus inferius floris sito, ovario 4-lobo, lobis tumidis vesiculosis carinis 2 papillosis instructis, stigmatibus 4 ad apicem loborum, inferiore majore, superiore minimo; capsula 1-loculari, ante anthesin ore aperto, marginibus valvularum intus reflexis; seminibus numerosis reniformibus, placentis 4 parietalibus suturas subtendentibus affixis.

Bergia odorata, (mihi.)

Ramis decumbentibus ramosis teretibus pubescentibus. Foliis oppositis bistipulatis oblongo-ellipticis sessilibus serratis pubescentibus, stipulis subulatis, ramulis axillaribus; floribus axillaribus 1-3 utraque axilla pedunculatis, pedunculis 1-floris, calyce 5-sepalo, sepalis ovatis pubescentibus, petalis 5 obovatis integris; staminibus alternis brevioribus, stylis 5, ovario 5-loculari.

Odor aromaticus *Anthemidis*.

Habitat in inundatis proper Báláwali.

Malva Malwensis, (mihi.)

Prostrata hirsutissima, ramis teretibus, foliis petiolatis quinquefidis, segmentis 2-lobis obtusiusculis; floribus axillaribus subsolitariis ad apicem ramorum subracemosis, foliis floralibus minimis sub-nullis petiolatis. Bracteolis 6 subulatis. Calyce ventricoso hirsutissimo. Corolla pallida calyce vix longior. Carpella 7, 8, plerumque 9, lateribus planis rugosis, dorso costato.

Odor aromaticus *Pelargonii.*—Crescit cum præcedente.

Astragalus Sesameus, DC. II. p. 288.

Ramis decumbentibus humi adpressis longis simplicibus teretibus hirsutiusculis, foliis alternis 5-7-foliolatis, foliolis ovalibus hirsutiusculis, stipulis liberis cuneatis; racemis axillaribus, pedunculis per anthesin folio brevioribus, fructiferis elongatis, floribus subcapitulatis brevissime pedicellatis, bracteis subulatis ciliatis; calyce hirsuto 5-dentato, dentibus acutis, supra fisso, vexillo obovato emarginato recto, alis oblique ovatis unguiculatis, carina obtusa, stam. 1-9, filamentis brevibus, antheris hirsutis, stylo brevi curvato, stigmate capitato glabro, legumine ovato, dorso sulcato, cum stylo persistente apiculato villoso, seminibus oblique reniformibus.

Flores minuti pallide purpurei. Lodihana.

Astragalus incurvus, DC. II. p. 304.

Perennis hirsutus, caulibus radiatim prostratis, foliis alternis petiolatis alternatim pinnatis, foliolis oblique ovatis apice acutis hirsutis, stipulis subulatis petiolo adnatis, floribus capitulatis, pedunculis axillaribus brevibus 4—5-floris, bracteis subulatis hirsutis; calycibus 5-partitis, segmentis subulatis; corolla purpurascente, vexillo longo obliquo valde emarginato carina duplo longiore, alis vexillo brevioribus 1-dentatis, leguminibus stellatim dispositis, margine inferiore introflexo, falcatis gibbis hirsutis, utroque loculo 4-spermo, seminibus rhomboideis.

Malwa et Pentepotamia.—These two plants are remarkable as being identical with or very strongly resembling the two African species to which I have referred them.

Heliotropium.

Perenne ramosissimum omnino pilis sub-spinosis asperrimum; foliis sessilibus lanceolatis valde rugosis asperrimisque; corymbis subterminalibus dichotomis, floribus sessilibus, calycis segmentis obtusis marginatis pilosis, corollæ tubo ventricoso viridi calyce dimidio longiore inferius piloso, margine brevi undulato albo 5-fido, segmentis rotundis, capsula lævi rugosiuscula vix 4-partibili. In arenosis Malwæ et Lodihanæ copiosissimum.

Boraginearum species.

Annua erecta ramosa hirsutissima, pilis mollibus spinulosisque mixtis; foliis lanceolatis distanter crenatis, ad crenas costasque spinulosis aliter villosis; floribus racemosis pedicellatis, racemis foliolosis; calycibus ventricosis, 10-costatis, 5-partitis, corolla tubulosa limbo 5-partito segmentis

rotundis, fauce breviter 5-fornicata intus pilosá at non clausa, staminum filamentis brevibus antheris ovatis cærulescentibus, pistillo recto libero, stigmate clavato, nucibus basi affixis oblique ovatis subrugosis apice acutiusculis, basi perforatis fauce perforationis plicata.

Herba habitu *Hyoscyami* calyce *Physalin* vel *Lychnidem vespertinam* æmulans. Corolla alba.—Malwa, Pentepotamia.

Orobanche Calatropidis.

Spica confertiflora, caule (vel rachi) glabra spongiosa succi (aquæ similis) plena, bracteis ternis 1-floris, unâ inferiore majore ovata apice acuminata demum marcescente calycem superante carnosa purpurascente supra fulvâ, duabus lateralibus ellipticis canaliculatis lateribus versus basin pilis carnosis ciliatis, aliter glabris, calyce brevioribus; calyce 5-fido, segmentis obtusis glabris, corolla ringente tubo calyce subduplo longiore curvato, limbo bilabiato labio superiore 2-fido minore suberecto, segmentis rotundis emarginatis purpureis, inferiore patulo 3-fido segmentis rotundis emarginatis ad marginem purpurascente, intus flavo, fauce valleculis 2 luteis instructa, staminibus 4 didynamis inferioribus longioribus, glaberrimis, junioribus in antherium lineare antheram superans productis quod postea marcescens ad antheram affingitur, antheris 2-lobis cordatis pilis albis presertim ad basin marginesque saccarum hirtis, junioribus hisce pilis arcte coalitis post impregnationem discedentibus, polline ovali. Pistillo glaberrimo ad basin ovarii disco luteo circumdato, ovario conico 1-loculari placentis 4. Stylo staminibus longiore medio angustato curvato, stigmate in apice clavato, stylo glanduloso.

Crescit in radicibus *Calatropidis Hamiltonii* in arenosissimis *Malvæ*. Scapo 1—3-pedali crassissimo, bracteis inferioribus sæpius efloratis.

Plantago Bauphúla, (mihi.)

Caulibus decumbentibus ramosis subhirsutis foliis alternis amplexicaulibus, lineari-lanceolatis distanter denticulatis, sub-carinatis, pilis raris apice articulatis hirsutiusculis, pedunculis axillaribus folio longioribus minute hirsutis vel subglabris viridibus vel purpurascentibus, spicis confertifloris ovatis, bracteis unifloris costis viridibus marginibus latis scariosis inferioribus carinatis apiculatis majoribus (at non foliaceis), sepalis 4, rotundato-ovatis, 2 exterioribus inferioribusque bracteiformibus costa viridi, 2 interioribus omnino membranaceis. Corollæ limbo 4-fido, segmentis ovatis acuminatis scariosis, staminibus in fauce insertis, filamentis filiformibus purpureis segmentis corollæ æqualibus, antheris ovatis versatilibus luteis, stylo exserto apice hirsutiusculo; capsula membranacea ovata versus fundum circumscissa, rosea, seminibus 2 naviculiformibus, albumine concavo ovato, embryone centrali immerso, radiculâ inferiore, cotyledonibus linearibus, placentâ centrali ovatâ crassiusculâ in medio laterum in valle lineari excavata propter receptionem seminis dein in fructu membranaceâ.—Malwâ et Pentepotamiâ.

Salsola Láná, (*mihi*).

Frutescens ramosissima, foliis breviter petiolatis cylindraceis vel ovatis rectis vel falcatis acutiusculis vel obtusis, floribus 3—4 glomerulatis axillaribus sessilibus, sepalis 5 concavis rubris, stamina iis opposita tegentibus, filam. 5 brevibus, antheris viridibus, stylis 2—3—4-brevibus rectis exsertis, ovario unico.

Fructum maturum non vidi.—Malwá et Pentepotamia.

XVII.—*Contributions towards a Flora of South America.—Enumeration of Plants collected by* Mr Schomburgk *in British Guiana.*—By George Bentham, Esq., F.L.S., &c., &c.

[*Continued from page* 223 *of this Vol.*]

MELASTOMACEÆ.

De Candolle's subdivision of *Melastomaceæ* into a large number of genera has been generally adopted, although various modifications of detail have been proposed by Blume, Martius, Chamisso, and others; and any monographist who, with the vast materials now existing in herbaria, may again take up the Order, will probably follow the steps of De Candolle as to the leading features of his system, however much he may improve on particular portions. I am far from entering upon any such general investigation; but in the course of the determination of M. Schomburgk's collection, a few observations have occurred to me as to the relative importance of some of the characters used, and as to the prominent diagnostics of some of the genera, which I am induced to record here, in the hope that they may tend to facilitate the determination of South American collections.

The exception to the usual dehiscence of the anthers, which has given rise to the separation of a distinct Suborder, under the name of *Charianthea*, is certainly very remarkable; but appears scarcely to be sufficiently natural to justify the importance attached to it. The genera bear, indeed, most of them, more resemblance to corresponding genera among *Miconieæ*, than to each other, and it may be better therefore to consider, with Blume, the *Chariantheæ* as merely a fifth tribe closely allied to *Miconieæ*.

The form of the seeds in *Melastomaceæ*, although it does not always occasion perfectly natural separations, and is in some few cases ambiguous, yet upon the whole, seems to be, as observed by Blume, the most important character that can be relied upon for the primary division. It may in the greater number of cases be ascertained with a little practice in the ovules even at the time of flowering.

Blume is of opinion that De Candolle relies too much on the two other characters, introduced by him in the distinction of the tribes; the capsular or baccate fruit, and the presence or absence of the setæ on the ovary; the one used to separate *Lavoisiereæ* from *Miconieæ*, the other to distinguish *Osbeckieæ* from *Rhexieæ*. These are certainly not characters of organic importance; still in other instances in which they are relied upon by De Candolle, they appear to be both definite and constant, and therefore practically useful. The setæ are indeed variable in *Miconieæ*, and so is the consistence of the fruit in *Osbeckieæ;* but it is a distinguishing feature in all *natural* classifications, that individual characters seldom retain the same relative value in the different divisions of the same group.

The five tribes of *Melastomaceæ* may therefore be readily distinguished by the following short characters, which are not perhaps in all cases, strictly absolute; but the exceptions and ambiguous species will, it is believed, be found to be but very few.

Tribus I. *Osbeckieæ.* Semina cochleata. Ovarium setosum. (Bacca v. capsula.)

Tribus II. *Rhexieæ.* Semina cochleata v. incurva. Ovarium nudum. (Capsula dehiscens).

Tribus III. *Lavoisiereæ.* Semina recta v. subrecta. Capsula dehiscens.

Tribus IV. *Miconieæ.* Semina recta. Bacca indehiscens. Antheræ (ut in præcedentibus) 1—2-porosæ.

Tribus V. *Chariantheæ.* Semina recta. Bacca indehiscens. Antheræ rima longitudinali dehiscentes.

In the distinction of genera I fear that too much reliance

has been placed upon the number of parts in each floral or carpellary verticil. In some cases, indeed, it is still the only tangible character by which very natural genera can be distinguished, while in others it has already been admitted as uncertain by all the above quoted authors. There are some instances, however, where both De Candolle and Martius appear to me to have on this account only, broken up affinities really very close. Martius has, it is true, united *Arthrostemma* with *Chætogastra*, *Sagræa* with *Clidemia*, &c.; but on the other hand he has separated *Noterophila* from the herbaceous *Microliciæ*, which he expressly states are not to be distinguished by any other character but the number of cells of the capsule, their habit being precisely the same.

It will also be seen by some of the modifications proposed below, that I should be disposed to go even farther than Martius in lowering the value set upon the appendages to the calyx; whether external, of the nature of hairs, as in *Osbeckieæ*; or arising from the internal development of the margin of the sepals beyond the midrib, as in *Miconieæ*.

Tribe I. Osbeckieæ.

The baccate genera in this tribe, *Otanthera*, *Melastoma*, and *Tristemma*, are not American; *Aciotis* being apparently founded on a mistake. The capsular species of the old world are at present included in *Osbeckia*, to which *Lachnopodium* has lately been added, though with some doubt. The American capsular genera may be reduced to four, *Pleroma*, *Tibouchina*, *Chætogastra*, and *Macairea*.

Pleroma of Don, is evidently the same genus as *Lasiandra* of De Candolle, including, according to Chamisso, *Diplostegium* of Don, and the former name being the older should be retained. The original species have now all been re-examined, and are all found to have a dry dehiscent fruit, although the calyx is more completely and more permanently adherent than in most capsular genera. The separation of *Pleroma* from *Osbeckia* is, as observed by Martius, but very slight; both genera being distinguished from *Chætogastra* by the

same character, the deciduous lobes of the calyx. In *Osbeckia* the calyx is usually more or less covered with palmate or stellate hairs or appendages, and the stamens are smooth; in *Pleroma*, the hairs or bristles of the calyx are equally simple, and the filaments more or less hairy, but neither of these characters is constant. In habit, *Osbeckia* agrees rather with some sections of *Chætogastra*, and as in that genus the flowers are sometimes 4-merous, sometimes 5-merous; but the *Osbeckia canescens* (E. Mey.) appears really to be nearer *Pleroma* than *Osbeckia*, although a native of South-East Africa.

There are no *Pleromas* in the Guiana collections before me; but among my Brazilian ones I observe nos. 33, 40, 398, 403, 404, 406 to 412, and 1603 of Gardner, and n. 269 of Blanchet, and n. 1272 of Mathews from Peru.

Tibouchina is intermediate between *Pleroma* and *Chætogastra*, to the former of which Chamisso unites it. All the species are covered with thick rigid appressed setæ; the habit is that of some *Chætogastræ;* the limb of the calyx is almost persistent; and the bracts are persistent, which never occurs in *Pleroma*, whilst the stamens are often hairy as in that genus. Besides Aublet's species, Mathews n. 1267, and two or three Brazilian ones belong to this genus.

Chætogastra, including *Arthrostemma*, and *Svitramia*, (Cham.) and perhaps *Centradenia*, (Don), or *Plagiophyllum* (Schlecht.) and *Heeria*, (Schlecht.), may be divided into several natural sections, some of which might be perhaps conveniently considered as genera; but for this purpose it does not appear that the number of parts can be used, which has been done by De Candolle and by Chamisso. My materials are not at present sufficient to satisfy me as to the number or the limits of these sections; but it appears to me that *Arthrostemma campanularis* should be associated with *Chætogastra stricta*, *echinata*, *cernua*, *conferta*, and other stiff Peruvian shrubby species with pendulous flowers; that the greater number of De Candolle's *Diotantheræ* with erect flowers form a second group, to which belong perhaps some *Arthrostemmata* of the section *Ladanopsis;* that *Chætogastra divaricata*,

DC., should form of itself a section which I have called *Echinogonum*, on account of the remarkable calyx; that a fourth group is that referred by De Candolle to *Osbeckia*, under the sectional name *Pterolepis;* that *Ladanopsis* (DC.), is a fifth, and that *Monochætum*, (DC.), *Trifurcarium*, (DC.), *Centradenia*, (Don), and *Heeria*, (Schlecht.), are either distinct genera, or so many additional sections of *Chætogastra*. The first two of the above sections are generally pentamerous, with a few tetramerous or variable species; the third is pentamerous; the fourth is as often tetramerous as pentamerous; the fifth usually and the remainder always tetramerous. The number of cells of the capsule, in all the species I have examined, corresponds with that of the parts of the flower.

Macairea is readily known by the glandular setæ of the calyx and ovary, and the stipitate glands of the longer filaments. They are all shrubs, with the upper side of the leaves closely covered with tubercles or pustules, usually terminating in rigid erect setæ, so that they can scarcely be described as glabrous, as in De Candolle's generic character, though they certainly have not on the upper side the ferruginous down of the under one.

313. Tibouchina *aspera, Aubl.—DC. Prod.* III. *p.* 144.—Savannahs, British Guiana, Schomburgk, n. 252.

314. Chætogastra (*Diotanthera*) *gracilis, DC. Prod.* III. *p.* 133.—Marshy savannahs, Mount Roraima. Schomburgk.—Chamisso is probably right in uniting this plant, the *C. repanda*, (Mart.), and several others under one name.

315. C. (*Diotanthera*) *hypericoides, DC. Prod.* III. *p.* 132.—*C. lychnitoides, DC. l. c.*—British Guiana. Schomburgk, n. 133 and 719.—A common plant in North Brazil. Gardner's n. 377 appears to be *C. Martiana, DC.*

316. C. (*Echinogonum*) *divaricata, DC. Prod.* III. *p.* 132.—British Guiana. Schomburgk, n. 721.

317. C. (*Pterolepis*) *glomerata, Mart.*—Osbeckia glomerata, *DC. Prod.* III. *p.* 141.—Arthrostemma glomeratum, *Cham. Linnæa*, IX. *p.* 454.—Flores sæpe pentameri.—British

Guiana. Schomburgk, n. 248. Bahia, Gardner, n. 880, and Pernambuco, n. 1005.

318. C. (*Pterolepis*) *callichæta* (sp. n.); herbacea? foliis brevissime petiolatis oblongo-lanceolatis obtusis integerrimis trinerviis utrinque cauleque pilis rigidis appressis strigosis, floribus ad apicem rami sessilibus subcapitatis 4-meris 8-andris, calyce setis longe ciliato-pectinatis hirsutissimo laciniis lanceolatis ciliatis, antheris oblongo-linearibus longe rostratis, connectivo brevi basi tumido.—Affinis *C. glomeratæ*, antheris et hirsutie diversa. Flores majores, setis longioribus densioribus rubentibus.—British Guiana. Schomburgk.

319. C. (*Ladanopsis*) *ladanoides*, *Mart.*—Arthrostemma ladanoides, *DC. Prod.* III. *p.* 136.—French Guiana, Leprieur, *Herb. Par. n.* 88 and 89.

320. C.? *lasiophylla*; suffruticosa, humilis, ramis erectis rufo-villosis subviscosis, foliis parvis sessilibus ovatis integerrimis crassis utrinque villosis superioribus minimis remotis, panicula laxa oblonga pauciflora, calycibus ovato-globosis rufo-hirtis dentibus ovatis tubo brevioribus, petalis (obovatis?) hirtellis, antheris inæqualibus ovali-oblongis rectis, connectivo brevi basi tuberculoso, capsulis apice setoso-hirtis.—Ramus unicus adest e basi lignoso simplex, erectus, semipedalis. Folia in parte inferiore approximata, 3—4 lin. longa. Paniculæ rami dichotomi, 2—3-flori. Flores tetrameri, parvi. Capsula 4-locularis. Semina cochleata.—Probably belonging to a distinct section.—British Guiana, Schomburgk.

321. Macairea *thyrsiflora*, *DC. Prod.* III. *p.* 109.—Folia ovali-oblonga 2—3-pollicaria, coriacea (in *Prodromo* sphalmate typographico *rosacea* dicta), supra tuberculis crebris ad setas non abeuntibus obtecta.—Rio Padawire. Schomburgk.

322. M. *multinervia* (sp. n.); suffruticosa, erecta, rufo-hirsutissima, foliis breviter petiolatis lato-ovatis basi cordatis 9—11-nerviis utrinque hirsutissimis, panicula thyrsoidea terminali pauciflora basi foliosa, capsula 4-loculari.—Caulis

durus, basi lignosus, bipedalis. Folia 1—1½ pollicaria. Pili in parte superiore caulis, in inflorescentia et calyce glandulosi. Pedicelli calyce longiores. Calycis tubus ovatus, laciniæ 4 lineares, pilis numerosis glanduliferis hirtæ. Petala obovata, glabra. Filamenta staminum majorum glandulis paucis stipitatis hinc onusta. Capsula ovoideo-globosa, apice glanduloso-pilosa. Semina incurva subcochleata, tubo basilari.—Moist savannahs, Roraima. Schomburgk. —A single specimen injured by insects, but evidently a very distinct species, with some general resemblance to the figure of *Rhexia cardinalis* (*Bonpl.*).

323. M. *pachyphylla* (sp. n.); fruticosa, ramis setis rufis hispidissimis, foliis petiolatis oblongo-ellipticis utrinque angustatis 3—5-nerviis crassis, supra setis rigidis densissime obtectis, subtus rufo-villosis, panicula terminali multiflora, calycibus glanduloso-pilosis, capsula 4-loculari.—Folia 2—4-pollicaria, sæpe disparia. Setæ paginæ superioris e tubercula ortæ incurvæ. Panicula pilis apice glanduliferis dense hirsuta. Bracteæ lanceolatæ acuminatæ calyci juniori æquilongæ, sub anthesi sæpius delapsæ. Calycis tubus 1½ lin. longus, laciniis 4 linearibus tubo subæquilongis. Stamina longiora hinc glandulifera. Capsula matura calycis tubum subsuperans, apice glanduloso-pilosa.—Swampy savannahs, British Guiana. Schomburgk, n. 452. Also from Mount Roraima.—This species is very near *M. Adenostemon*, and is possibly a mere variety; but the leaves are much longer, the hairs far more rigid and longer, the bracteæ smaller and narrower, &c.

324. M. *rigida* (sp. n.); fruticosa, ramis setis rufis hispidis, foliis breviter petiolatis ovali-ellipticis 3—5-nerviis utrinque obtusis supra strigis validis echinatis subtus rufo-villosis, panicula terminali densa multiflora, calycibus glanduloso-pilosis, capsula 3-loculari.—Folia 2—3-pollicaria, coriacea. Setæ paginæ superioris rigidæ incurvæ, e tuberculis clavatis in pagina inferiore impressis ortæ. Panicula abbreviata, fere corymbosa, dichotome ramosissima, ramis glanduloso-pilosis.

Calycis tubus $1\frac{1}{2}$ lin. longus, laciniæ 4, subulatæ. Filamenta longiora hinc glandulifera. Capsula apice glanduloso-pilosa. —Mountains of Mawacca. Schomburgk, n. 1015.

325. M. *parvifolia* (sp. n.); fruticosa, ramis hispidis, foliis longiuscule petiolatis ovali-oblongis ellipticisve utrinque obtusis v. basi angustatis supra strigoso-setosis subtus breviter rufo-villosis, panicula terminali subcorymbosa laxa pauciflora subfoliosa, calycibus glanduloso-pilosis, capsula 3-loculari.— Near the last in character, but very different in appearance; the leaves being seldom more than an inch long, and the panicle short, composed of a few dichotomous cymes in the upper axils.—Mount Roraima, Schomburgk. Blanchet's n. 2900 appears to be *M. Radula*, DC.

Tribe II. Rhexieæ.

From this tribe, *Siphanthera* must be excluded as belonging to *Lavoisiereæ*, and *Adelobotrys* is of doubtful affinity, most probably very near *Chætogastra*. Among the true *Rhexieæ*, *Oxyspora* from East India, *Rhexia* from the United States, and *Heteronoma*, (including *Pachyloma* according to Martius) from tropical America, are known by their tubular or elongated calyx, and paniculated inflorescence; *Leiostegia* has the same calyx, but with axillary flowers; *Tricentrum* is said to have very peculiar anthers; *Trembleya* and *Microlicia* are both pentamerous and decandrous, and have been distinguished by the number of cells of the capsule, which are 2 or 3 in *Microlicia*, (including *Noterophila*, Mart.), 5 in *Trembleya*, an unnatural distinction, as it removes *T. rosmarinifolia* from a species of *Microlicia*, from which it cannot otherwise be known, and joins it with the *Abrahamiæ*, which it does not resemble at all; *Spennera*, (including *Ernestia*), is either pentamerous or tetramerous, but is always readily discriminated by the thin foliage, the slender loose panicles and conical buds; *Marcetia* and *Comolia*, always tetramerous, are much branched low shrubs or decumbent perennials with axillary flowers, the one having four, the other two cells to the capsule; *Dicrananthera* is a little erect annual with

small axillary tetramerous flowers, a two-celled capsule and dissimilar anthers. Finally, *Appendicularia*, another little erect annual, possesses a very peculiar calyx and habit, and differs moreover from all other *Rhexieæ*, by the combination of a tetramerous flower with a three-celled capsule.

326. Leiostegia *vernicosa* (Gen. Nov.) Dry savannahs, British Guiana. Schomburgk, n. 243.

Leiostegia.

Char. Gen. *Calyx* cylindraceus, ore truncato, dentibus 4 parvis distantibus. *Petala* 4, obovata. *Stamina* 8, parum inæqualia; *antheris* lineari-falcatis rostratis uniporosis, longiorum connectivo postice in appendicem bifidum producto, breviorum bituberculato. *Ovarium* læve. *Capsula* oblongo-ovata, 4-locularis. *Semina* cochleata.—*S. vernicosa.* Frutex *glaber, superne vernicosus, siccitate nigricans.* Rami *tetragoni.* Folia *brevissime petiolata, 1—2-pollicaria, oblongo-lanceolata, obtusa, integerrima, margine revoluta basi angustata, uninervia, supra glabra nitida, subtus albida.* Flores *axillares 1—3-ni subsessiles.* Calyces *glabri vernicosi.*

Gardner's n. 379 and 380, appear both to be referrible to *Trembleya Heterostemon.*

327. Microlicia *brevifolia, DC. Prod.* III. *p.* 117.—French Guiana. Leprieur, Herb. Par. n. 74.—*Micrólicia*, as observed by Martius, consists of two very natural groups; but then the one, that which contains this species, should include *Noterophila*, (Mart.), and the other would perhaps be much improved if it were made to comprehend *Chætostoma pungens*, and *diosmoides*, (neglecting here as in *Chætogastra*, the appendages of the calyx), and the section *Jacobia* of *Trembleya.* To this second group belong n. 2606, and 2781 of Blanchet.

328. M. *recurva, DC. Prod.* III. *p.* 118.—British Guiana, Schomburgk, n. 106, in the earlier sets.—French Guiana, Leprieur, Herb. Par. n. 80.

329. M. *myrtoidea? Cham. Linnæa*, IX. *p.* 39.—Mount Wareima. Schomburgk.—This agrees in all respects with Chamisso's description, except that the young branches are

compressed, and as they grow old they become covered with black spreading hairs, and the seeds are but little curved.

330. Marcetia *taxifolia, DC. Prod.* III. *p.*124.—High mountains in the Sierra Parima near Roreima. Schomburgk, n. 1040.—Alagoas, Gardner, n. 1288.—Gardner's n. 1287, and Blanchet's n. 2607, 2608, and 2610, appear also to be *Marcetias.*

331. Comolia *microphylla*, (sp. n.); fruticosa, divaricato-ramosissima, viscoso-hirta, foliis petiolatis ovatis trinerviis subserratis utrinque viscoso-villosis, calycis laciniis ciliatis. Rami pilis glanduliferis rubiginosi. Folia pleraque 3—4 lin. longa, vix unquam semipollicaria, crassiuscula, basi rotundata vel angustata. Flores axillares solitarii, breviter pedicellati. Calycis tubus 1—1½ lin. longus, ovatus, limbi laciniæ 4 oblongo-lineares sinu lato separatæ, pilis longis apice glanduliferis ciliata. Petala 4, calyce plus duplo longiora, obovato-orbiculata. Stamina 8. Antheræ oblongo-lineares, connectivo postice breviter producto incurvo obtuso. Capsula calyce inclusa, glabra, 2-locularis, 2-valvis. Semina cochleata.—British Guiana. Schomburgk, n. 106, in the later sets.

332. C. *veronicæfolia* (sp. n.); herbacea vel suffruticosa, ramis elongatis procumbentibus v. divaricatis pilosis, foliis petiolatis obovatis serrato-ciliatis trinerviis sparse pilosiusculis. —Habitus fere *C. berberifoliæ*, sed folia minime *Berberidis*, brevius ciliata. Pili ramorum sparsi, sæpe glanduliferi. Folia distantia, 6—9 lin. longa, tenuia, subviscosa. Flores axillares, breviter pedicellati, solitarii v. in pedunculo brevi folioso 2—4. Calycis tubus 2 lin. longus, fructifer globosus, laciniæ 4, oblongo-lineares, sinu lato separatæ, pilis longis apice glanduliferis ciliatæ. Petala 4, ampla, obovata. Stamina 8. Antheræ lineares, connectivo postice breviter producto bifido. Capsula calyce inclusa, glabra, 2-locularis, 2-valvis. Semina incurva, subcochleata.—British Guiana. Schomburgk, n. 326.

333. Spennera *dichotoma* (sp. n.); annua, humilis, erecta, caule tetragono angulis acutis ciliatis, foliis breviter petiolatis

ovatis v. ovato-lanceolatis serrato-crenulatis basi angustatis trinerviis tenuiter membranaceis pilis sparsis raris v. nullis, panicula divaricato-dichotoma, floribus 4-meris, 8-andris, antheris breviter ovoideis, capsula biloculari.—Herba tenera vix semipedalis. Folia inferiora lata, 6—9 lin. longa, superiora angustiora sesquipollicaria. Panicula bis terve dichotoma, pilis paucis capitatis onusta, floribus secus ramos subsessilibus. Bracteæ minutæ. Calyx 1 lin. longus, fructifer subglobosus membranaceus, laciniæ limbi breves ovatæ. Petala oblonga. Antheræ vix dimidio longiores quam latæ, connectivo brevissimo vix conspicuo. Capsula calyce inclusa membranacea, bivalvis. Columna cum placentis post semina, et valvulos delapsa diu persistent. Semina reniformia subcochleata.—Swampy situations on the Essequibo and Rupunoony. Schomburgk, n. 513.

334. S. *dysophylla* (sp. n.); caulibus basi decumbentibus laxis tetragonis v. alatis hirsutis dichotome ramosis, foliis petiolatis ovatis v. ovato-lanceolatis acutis 5-nerviis basi rotundatis cordatisve ciliato-serratis supra et subtus ad venas pilis crebris rigidis hirsutis, panicula brevi laxa, ramis dichotome ramosis, floribus sessilibus 4-meris, 8-andris, antheris oblongis, capsula biloculari.—Annua videtur, v. semel redi-viva. Caules semipedales, v. vix pedales. Folia 1—1½-pollicaria. Flores fere *S. dichotomæ*, antheræ tamen fere ter longiores quam latæ, connectivo brevi. Capsula et semina *S. dichotomæ*.—Affinis *S. polystachya*, sed vix eadem, a *S. laxa* differt prima facie caule annuo nequaquam frutescente.—Sands, Barcellos on the Rio Negro. Schomburgk, n. 932.

S.? *latifolia*, præcedenti parum major, folia latiora, evidentius cordata, sæpius 7-nervia, panicula longior, flores breviter pedicellati.—On the Essequibo. Schomburgk, n. 16.

335. S. *indecora?* *DC. Prod.* III. *p.* 116.—Folia 2—3½ poll. longa 5-nervia tenuiora quam in præcedente. Panicula laxa. Bracteæ minimæ. Antheræ longiores.—Abandoned fields, British Guiana. Schomburgk, n. 200.

336. S. *viscida* (sp. n.); fruticosa, ramulis paniculisque pubescenti-hirtis viscosis, foliis longiuscule petiolatis ovatis

acuminatis basi cordatis tenuibus membranaceis viscoso-pilosulis margine ciliatis vix minute serrulatis, panicula pyramidata multiflora, ramis dichotomis, bracteis minutis, floribus brevissime pedicellatis 4-meris 8-andris, calyce glanduloso-puberulo dentibus minutis, antheris oblongis, capsula biloculari.—Frutex 5—6-pedalis. Folia pleraque bipollicaria. Flores fere *S. dysophyllæ*, v. vix majores.—British Guiana. Schomburgk, n. 999.

337. S. *circæoides, Mart. in DC. Prod.* III. *p.* 116.—Antheræ alternæ ovato-oblongæ, alternæ oblongæ fere duplo longiores. Connectivum ut in præcedentibus anthera brevius.—Rio Parime. Schomburgk.

338. S. *circæifolia, DC. Prod.* III. *p.* 116, (var. glabrata). Antheræ præcedentis. Folia basi late cordata, lucida, subpellucida. Petioli et ramuli pilis paucis longis ciliati v. rarius nudi.—Pedrero. Schomburgk, n. 863.

339. S. *aquatica, Mart. in DC. Prod.* III. *p.* 116.—British Guiana. Schomburgk, n. 456. French Guiana, Leprieur. *Herb. Par. n.* 87. Bahia, Gardner, n. 881.

340. Appendicularia *thymifolia, DC. Prod.* III. *p.* 114.—French Guiana. Leprieur, *Herb. Par. n.* 64 and 84.

Tribe III. Lavoisiereæ.

The *Lavoisiereæ* do not form so natural a tribe as some others; some genera having the habit of *Rhexieæ*, and indeed, even in respect of the form of the seeds, the line of distinction is difficult to trace between them; others again have the habit of *Miconieæ*, and some have a facies different from that of all other *Melastomaceæ*.

Among these, a very natural group consists of the East Indian genera *Sonerila*, and *Sarcopyramis*, and the American *Salpinga*, *Bertolonia* and perhaps *Lithobium* (*Bongard*). They are all low herbs, with obconical or turbinate calyces, triangular capsules usually truncate, and a peculiar inflorescence, which renders it easy to distinguish them.

Rhynchanthera, *Siphanthera*, *Meisneria*, and *Poteranthera*, (*Bongard*,) are known by the sterility or abortion of half the

stamens. In *Meisneria*, the flowers are tetramerous, the capsule two-celled, and the anthers have a short beak. In *Rhynchanthera*, the flowers are pentamerous, the capsule three, four, or five-celled, and the anthers have a long beak, one anther being often nearly twice as long as the rest. *Siphanthera cordata* has the flowers and capsule of *Meisneria*, but the anthers have a long beak. This character, which gave the name to the genus, does not exist in the *Siphanthera tenera*, and *S. subtilis*, (both the same species, judging from Pohl's specimens), the sterile stamina also (as pointed out by Martius), are not completely wanting, and it may therefore be well to join *Siphanthera* to *Meisneria*. *Poteranthera* (according to Bongard's figure), is near *Meisneria*, but differs in the pentamerous flowers, trilocular capsule, and truncate biporose anther.

Meriania and *Axinæa*, with biporose anthers, are scarcely any of them known to me; nor is *Chastenæa*, which is said to have the habit of *Meriania*.

Cambessedea has the characters of *Microlicia*, with the exception of the straight seeds which fix it in *Lavoisiereæ*, and the habit is rather different. *Chætostoma* has precisely the habit of *Microlicia*, and the pentamerous species should undoubtedly be there placed. *C. tetrasticha* is unknown to me.

Lavoisiera is a very distinct genus, consisting of low smooth shrubs, closely covered with sessile leaves smooth on their surface though sometimes ciliate, and with terminal solitary pentamerous or polymerous flowers.

The remaining genera have the habit of the larger flowered *Miconiæ*; *Bucquetia* is tetramerous, *Davya* (with *Adelbertia*, Meisn.), *Haberia* and *Behuria*, are pentamerous, with long appendages to their anthers; *Centronia* and *Truncaria* are doubtful genera; so also is *Graffenrieda*, (of which one species is *Brachycentrum*, Meisn.), unless it be, as supposed by Martius, that genus of *Miconieæ*, which Chamisso has called *Jucunda*.

341. Salpinga *secunda, Schranck, et Mart.—DC. Prod.* III. *p.* 113. Banks of rivers in the Sierra Mey. Schomburgk.

342. S. *parviflora, DC. Prod.* III. *p.* 113.—Petala 4, oblonga. Stamina 8, consimilia. Connectiva postice subulato-appendiculata.—Shady places, British Guiana. Schomburgk, n. 318.

Gardner's n. 1009 is *Bertolonia maculata*, and n. 388, a new species nearly allied to *B. Leuzeana*, DC.

343. Meisneria *cordifolia* (sp. n.); perennis v. suffruticosa, humilis, erecta, hirsutissima, foliis sessilibus late cordato-ovatis margine revolutis, bracteis parvis oblongis acuminatis.—Caulis basi perennis, sublignosus. Rami erecti, stricti, ramosi, usque ad apicem dense foliosi, 4—6-pollicares, pilis rigidis flavicantibus uti folia et calyces hispidi. Folia margine revoluta, 2—3 lin. longa. Flores axillares, inferiores solitarii, superiores cymosi, racemum oblongum terminalem foliosum formantes. Antheræ alternæ oblongæ rostratæ polliniferæ, alternæ lineares castratæ.—British Guiana. Schomburgk, n. 1062.

344. Rhynchanthera *grandiflora, DC. Prod.* III. *p.* 107.—Capsula trilocularis.—French Guiana. Leprieur, Herb. Par. n. 85.

345. R. *acuminata* (sp. n.); suffruticosa, elata, opposite ramosa, ramis brevissime viscoso-puberulis v. demum glabratis, foliis petiolatis lanceolato-cordatis acuminatis margine serrulato-ciliatis minute setulosis rarius hispidulis glabratisve 5—7-nerviis v. rarius 9-nerviis, panicula dichotoma laxa, floribus breviter pedicellatis pentandris monodynamis, calycis tubo ovato subglabro laciniis subulatis breviore, filamentis sterilibus filiformibus minimis.—Habitus laxior quam in *R. grandiflora.* Folia 2—3-pollicaria, majora vix pollicem lata. Flores fere *R. grandifloræ.* Capsula 4-locularis.—Savannahs at Anna-y. Schomburgk, n. 82. In some of the later sets the specimens belong to a more hairy variety.

346. R. *monodynama, DC. Prod.* III. *p.* 107.—Moist savannahs near Roreima. Schomburgk.—Capsule 4-celled.

347. R. *serrulata, DC. Prod.* III. *p.* 108?—French Guiana. Leprieur, Herb. Par. n. 75.—My specimen is not in flower, but appears to be this plant.

Gardner's n. 39 and 378, and Mathews n. 1273, 1276, and 1316, belong to *Rhynchanthera*. Gardner's n. 381 is *Lavoisiera imbricata*, (DC.).

TRIBE IV. MICONIEÆ.

Numerous as are the American species in this one of the best defined tribes, the great mass of them belong to two vast genera, *Clidemia* and *Miconia*, and even these are so near together in all essential characters, that it becomes very difficult to define them positively; yet they are so naturally separated, that few species of either may not at the first glance be referred to their proper genus. The only positive character appears to consist in the setæ (often very small) which crown the ovary in *Clidemia*, and are wanting in *Miconia*. But, in habit, the *Clidemiæ* are coarse plants, with rugose leaves, and generally more or less covered, especially the inflorescence and calyx, with rigid bristles or hairs, with or without an admixture of stellate down; whilst the *Miconiæ* have usually the upper side of the leaf smooth, and the under side, the stems and inflorescence, either smooth or covered with a close, short, somewhat farinaceous or floccose, or stellate down, the stems very seldom clothed with long soft hairs. The inflorescence of *Clidemia* is axillary or terminal, the flowers few and sessile, or numerous and paniculate; in *Miconia* it is always terminal and paniculate. The teeth of the calyx in *Clidemia* are frequently subulate; never perhaps in *Miconia*. The petals and stamens are nearly the same in both, and the fruit in both is equally variable in the number of cells from three to five, but it is usually more fleshy or pulpy in *Clidemia* than in *Miconia*.

The limitation, however, between these two genera and some of those separated from them is not so easy. Martius has already shown that *Tschudya* and *Sagræa* must be united with *Clidemia*, in many species of which the number of parts of the flower is variable. *Leandra*, it would appear, must share the same fate; for the duplication of the teeth of the calyx is more or less observable in many *Clidemiæ*, and

amongst the *Leandræ* of De Candolle, there are species corresponding in habit to almost every section of *Clidemia*. I am unacquainted with *Myriaspora*, which, according to all accounts is very near *Clidemia*, but has a ten-celled capsule; *Heterostichum* has also in many respects the habit of *Clidemia*, but the ovary is said to be destitute of setæ. The long lobes of the calyx distinguish it from *Miconia*, as well as the habit.

The true *Miconiæ* are all described as having pentamerous flowers, and I have not seen any that are not so. In *Tetrazygia* and *Ossæa*, they are tetramerous, the inflorescence being terminal in *Tetrazygia*, lateral in *Ossæa*; and as these genera do not, as far as hitherto known, run into *Miconia*, they do not appear objectionable, although distinguished by no other characters than these which are recognised as unavailable in the case of *Clidemia*. So it is also with *Oxymeris*, which is separated from *Miconia* by the same character which marks the *Nianga* in *Clidemia*, the acute petals. *Conostegia* and *Cremanium* possess more positive characters, the calyptriform calyx in *Conostegia*, the biporose anthers in *Cremanium* (including *Cyathanthera*, Pohl), and therefore these genera are convenient, although not distinguishable in habit from *Miconia*, and although some cases occur where there is a practical difficulty in ascertaining whether the anthers are in fact prolonged or not, beyond the partition between their cells.

The remaining American genera, mostly with larger flowers, differ more from *Miconia* in appearance, notwithstanding their somewhat vague character. *Phyllopus* and *Henriettea* have very fleshy fruits, and the style hairy at the base; *Henriettea*, with the inflorescence of *Ossæa*; *Phyllopus* with a peculiar habit, and the anther almost of *Tococa*. *Tococa* (including *Calophysa?*) has almost always the base of the leaf, or the leaf-stalk swollen into one or two air-bladders, and the flowers paniculate; where the bladders are wanting, it may be known from *Miconia* by the habit, by the more completely adherent ovarium, usually crowned by a ciliate

disk, and in most cases by the large anthers, which generally acquire a peculiar greenish hue in drying. *Maieta* has the bladders of *Tococa*, with the habit of the sessile-flowered *Clidemiæ; Calycogonium* is distinguished by the angular calyx, but is unknown to me. *Jucunda* differs from all *Miconieæ* by the fruit, which, though fleshy and enclosed in the calyx, is entirely free from it even from the time of flowering. *Diplochita* has the habit of *Jucunda*, but the fruit is perfectly adherent as in *Miconia*, from which it is discriminated by the calyx and inflorescence described below. *Blakea*, with biporose anthers, differs from *Cremanium* in habit, in the bracteas, polymerous flowers, connivent anthers, &c.

I am unacquainted with *Loreya*, and the East Indian genera have been so lately and so well treated of by Blume, that it is needless to advert to them here.

348. Jucunda *tomentosa.* Miconia tomentosa, *DC. Prod.* III. *p.* 183. Ovarium oblongum, etiam anthesi liberum, apice disco coronatum, triloculare. Fructus (immaturus) subbaccatus, calyce inclusus, liber.—Barcellos on the Rio Negro. Schomburgk, n. 929.

349. Diplochita *Fothergilla*, *DC. Prod.* III. *p.* 176.—British Guiana, Schomburgk, n. 489.—The coloured bracts vary much in size, and probably therefore, *D. florida* (DC.) is but a variety of this species.

350. D. *bracteata*, *DC. Prod.* III. *p.* 176.—A single specimen, found during Schomburgk's last expedition from British Guiana to the Rio Negro.

351. D. *Swartziana*, *DC. Prod.* III. *p.* 176.—French Guiana. Leprieur.

352. D. *parviflora* (sp. n.); ramulis subcompressis teretibusve, inflorescentia petiolis foliisque subtus tomento brevissimo rufescentibus, foliis petiolatis ovatis acuminatis integerrimis basi rotundatis 5-nerviis supra glaberrimis, panicula multiflora, bracteis lineari-oblongis deciduis, calycibus anguste urceolatis tomentosis obtuse dentatis, fructiferis globosis—Frutex 18-pedalis. Folia magnitudine fere *D. Fothergillæ*, sed supra

lævia. Rami paniculæ ad quemquam nodum 7—11. Bracteæ calyce breviores. Calyx florifer vix 2 lin. longus.—British Guiana. Schomburgk, n. 483.

I do not hesitate to place the above plant in *Diplochita*, although its bracteæ are much smaller than in the other species. The essential character appears to reside in the calyx, which is narrow-urceolate, with five very short simple teeth, in the larger and more pointed anthers, and in the inflorescence. The rachis of the panicle is compressed at each ramification, where it emits from the same point, five, seven, or more branches, not verticillate, but diverging in one plane like a fan. In several *Miconiæ*, it is true, such an arrangement may be seen to a certain degree in one or two of the primary ramifications; but in *Diplochita* it is carried through, even to the arrangement of the ultimate pedicels.

Miconia *astrolasia*, *DC.* (Melastoma astrolasion, *Spreng.*) from the description may possibly be a *Diplochita*. On the other hand, *Diplochita mucronata*, (DC.) judging from a Brazilian specimen in fruit which answers precisely to Bonpland's figure, is a species of *Jucunda* resembling much *Diplochita Swartziana* in appearance; but with a very different fruit, it being entirely free from the calyx.

353. Tococa (*Epiphysca*) *subnuda* (sp. n.); ramulis glabris nudis, foliis subæqualibus oblongis longe acuminatis ciliatis subglabris in limbo ipso vesiciferis v. superioribus planis, thyrso laxo multifloro, calycis glabri tubo oblongo basi longe attenuata dentibus brevibus latis brevissime acuminatis nudis, petalis obovato-oblongis staminibus parum brevioribus, ovario triloculari disco nudo coronato, stigmate subpeltato.—Habitus *T. coronatæ*. Folia interdum fere pedalia 2½—3½ poll. lata. Vesicæ sæpe parvæ aut nullæ. Petiolus ultra pollicaris, vix ciliatus. Calyx 6 lin. longus. Filamenta 4 lin., antheræ 3 lin. longæ. Petala rosea.—On the Essequibo, Schomburgk, n. 288.

354. T. (*Epiphysca*) *coronata* (sp. n.); ramulis glabris nudis, foliis consimilibus ovato-oblongis ellipticisve acuminatis margine subciliatis supra rarissime setosis, subtus ad nervos

rufo-pubescentibus, cæterum glaberrimis in limbo ipso vesiciferis, calycis tubo oblongo dentibus brevibus latis abrupte et longiuscule acuminatis vix ciliatis, petalis obovato-oblongis stamina subæquantibus, ovario triloculari disco brevi longiuscule ciliato coronato, stigmate peltato.—Folia 6-10-poll. longa, uti tota planta fere glabra. Calyx florifer 4 lin. longus, post anthesin parum longior, fere infundibuliformis. Petala rosea.—British Guiana. Schomburgk, n. 980.—In some sets, under the same number, there is a variety, or probably a distinct species, with longer leaves, shorter teeth to the calyx, and the disk of the ovary more prominent; and in other sets again is the following species:—

355. T. (*Epiphysca*) *truncata* (sp. n.); ramulis glabris nudis, foliis ovatis v. ovato-lanceolatis longe acuminatis basi subcordatis glabris nudis v. vix ciliatis, nunc subæqualibus omnibus in limbo ipso vesiciferis, nunc folio altero minore plano v. vix vesicifero, calycis glabri tubo obovoideo turbinato, limbo truncato obscure dentato dentibus brevissime mucronatis, petalis obovatis, staminibus brevioribus, ovario triloculari disco cupulato ciliato coronato, stigmate subpeltato.—Folia 4-6-pollicaria. Calyx 3 lin. v. vix 3½ lin. longus, fructifer urceolatus.—British Guiana. Schomburgk, n. 980, in some sets.

In the above three species the bladders of the leaves are placed at the base of the limb itself; in the three following, as well as in *T. formicaria* and *bullifera*, (Mart.), *T. Guianensis*, (Aubl.) the n. 1306 of Mathews from Peru, which is a new species, and in another new Brazilian species differing from *T. formicaria* by the cordate leaves and trilocular ovary, the bladder is on the petiole, and in my specimen of *T. planifolia* I see no trace of any bladder, which authorizes the division of this curious genus into three sections, *Epiphysca*, *Hypophysca* and *Anaphysca*. The *T. macrosperma* (Mart.) may form a distinct section, for which he proposes the name of *Myrmidoni*; but scarcely a genus, as the ovary is trilocular in so many *Tococæ*. Perhaps also *Calophysa* (DC.) would be better considered as a mere section of *Tococa*.

356. T. (*Hypophysca*) *aristata* (sp. n.); ramulis setosis, foliis parum inæqualibus oblongo-ellipticis acuminatis basi angustatis utrinque setosis membranaceis, petiolis setoso-hispidis, omnibus apice vesiciferis, calyce breviter turbinato setoso, dentibus ovatis longe aristatis, petalis obovatis stamina subæquantibus, ovario triloculari disco brevissimo nudo coronato, stigmate magno subinfundibuliformi peltato.—Sides of creeks, British Guiana. Schomburgk, n. 458.

357. T. (*Hypophysca*) *barbata* (sp. n.); ramulis subcompressis sub foliis linea decurrente petiolisque longe barbatis, foliis disparibus ovatis v. ovali-oblongis acuminatis aristatis supra vix setosis margine ciliatis subtus ad venas hirsutis subbarbatis, majorum petiolo vesicifero minorum nudo, calycis tubo ovato subsetoso limbo breviter et obtuse dentato longe ciliato, petalis staminibus parum brevioribus obovatis, stigmate peltato, ovario (triloculari?) disco cupulato ciliato coronato.—Folia majora (exteriora v. inferiora) 4-8 poll. longa, minora (interiora v. superiora) 2-4 poll. Petala rosea. Filamenta 3 lin. longa. Antheræ iis æquilonga.—Pedrero, Schomburgk, n. 887. The ovary is much pressed in my specimen, but seems to be three-celled. The very prominent placentæ in some *Tococæ* appear at first sight almost to divide each cell into two.

358. T. (*Hypophysca*) *Roreimi*, (sp. n.); ramulis compresso-tetragonis, foliis disparibus ovatis abrupte acuminatis supra sparse margine petiolisque setosis, venis subtus hirsutis, majorum petiolo apice vesicifero minorum nudo, calycis tubo obovoideo-turbinato limbo brevissime et obtuse dentato subciliato, petalis staminibus dimidio brevioribus orbiculatis, stylo crasso, stigmate vix dilatato, ovario triloculari disco cupulato ciliato coronato.—Folia majora 3-5 poll., minora 2-3 poll. longa, venis subtus valde prominentibus. Vesicæ 6-8 lin. longæ, parce setosæ. Calyx 2½ lin. Petala rosea. Filamenta 2 lin. longa. Antheræ paullo longiores.—Mount Roreima, Schomburgk.

359. T. (*Anaphysca*) *planifolia* (sp. n.); ramulis glabris nudis, foliis subæqualibus lanceolato-oblongis v. ovato-

lanceolatis acuminatis minute ciliatis glabris, vesicis nullis, calycis glabri tubo obovoideo-turbinato limbo truncato obscure dentato, ovario disco brevissimo nudo, stigmate late capitato subpeltato.—Very near in habit and flowers to *T. truncata;* but there appear never to be any bladders to the leaves, at least in my specimen; the leaves are also narrower, and disk of the ovary much shorter.—Pedrero, Schomburgk.

360. Phyllopus *Martii, DC. Prod.* III. *p.* 177.—Sandbanks of the Rio Negro. Schomburgk, n. 960.—This agrees precisely with De Candolle's description, except that the inflorescence, in some specimens, is more developed, and the leafy bracteæ very variable. The ovary is remarkably fleshy and adherent, and the anthers (like those of *Tococa*) uniporous, as stated by De Candolle. Martius, on the other hand, describes and figures the cells of the anthers as truncate, and consequently biporose, with the connectivum projecting in the form of a point beyond the cells. May not this be a case similar to those in which Bonpland was deceived, as shown by De Candolle, or even De Candolle himself, as pointed out by Chamisso in the case of *Ernestia*, from the tops of all the anthers in the flower examined having been eaten off by insects?

361. Henriettea *succosa, DC. Prod.* III. *p.* 178?—Folia majora semipedalia. Calyces juniores anguste urceolati, rufo-hispidi, fructiferi ovato-globosi fere glabri, basi ovario toto adnati. Petala nonnisi medio velutina. Vix tamen a planta Aubletiana speciatim distincta est.—British Guiana, Schomburgk, n. 403.

362. Clidemia (*Sessilifloræ*) *rubra, Mart. Nov. Gen.* III. *p.* 152, *t.* 281.—British Guiana, Schomburgk, n. 643. French Guiana, Leprieur, Herb. Par. n. 86. Panama. Cuming, n. 1259.

β. cordifolia, foliis latioribus basi plus minusve cordatis 7-nerviis.—British Guiana, Schomburgk.

363. C. (*Sessilifloræ*) *petiolata, DC. Prod.* III. *p.* 157. —French Guiana, Leprieur.

Gardner's n. 1606 belongs to the same group of *Sessilifloræ* as the foregoing, so also *Leandra angustifolia*, DC.

A second group, which may be called *Axillares*, comprehends the greater number of De Candolle's *Sagrææ* and a few of his *Clidemiæ*, with really axillary pedicellated flowers, amongst which are Gardner's nos. 35, 36, and 42, and Cuming's 1173. The remainder of De Candolle's axillary *Clidemiæ* would be better termed *Laterales*, the inflorescence, though in fact terminal, becoming immediately lateral by the speedy development of one of the upper lateral shoots. To this group belongs Gardner's n. 34.

364. C. (*Laterales*) *capitata* (sp. n.); ramis subteretibus pilis purpurascentibus strigoso-hirsutissimis, foliis breviter petiolatis ovatis v. ovato-lanceolatis basi subcordatis 3-5-nerviis setis supra rigidis infra mollioribus hirsutissimis, florum capitulis densis hemisphæricis pedunculatis solitariis terminalibus demum lateralibus, bracteis imbricatis exterioribus omnibusve flores superantibus.—Species distinctissima. Folia 1-2-pollicaria. Florum capitula fere *Compositarum* v. *Rubiacearum* capitatarum. Bracteæ lato-lanceolatæ interiores calyces amplectentes. Flores omnino *Clidemiæ* pentameri. Calyces hirsutissimi, laciniæ e basi lanceolata subulatæ, intus breviter duplicatæ. Petala ovali-oblonga obtusa. Ovarium disco coronatum cupuliformi apice setis glanduliferis ciliato. Antheræ basi obtusæ. Bacca junior 3-locularis.—Mount Roreima. Schomburgk.

365. C. (*Laterales*) *elegans*, *Don*, *DC. Prod.* III. *p.* 157.—On the Essequibo, Schomburgk, n. 5.

366. C. (*Laterales*) *spicata*, *DC. Prod.* III. *p.* 159.—French Guiana, Leprieur, Herb. Par. n. 73.—The teeth of the calyx are very slightly duplicate.

367. C. (*Laterales*) *umbonata*, *DC. Prod.* III. *p.* 159?—Habitus *C. spicatæ*. Flores 5-6-meri. Calyces in genere majusculi, hispidissimi, laciniis subulatis tubo subæquilongis intus basi membrana brevi ovata auctis. Petala oblonga. Ovarium 5-loculare apice glanduloso-setosum. Bacca dense pulposa.—Near Mount Roreima. Schomburgk.—Possibly a new species.

368. C. (*Laterales*) *pustulata*, *DC. Prod.* III. *p.* 159.—British Guiana. Schomburgk, n. 497.

369. C. (*Paniculatæ*) *rariflora* (sp. n.); ramis e compresso teretibus, petiolis inflorescentiaque pube laxa decidua et setis brevibus glanduliferis vestitis demum sæpe glabratis, foliis petiolatis lato-ovatis acuminatis denticulatis ciliatis basi late cordatis 5-9-nerviis supra bullulatis v. subplanis utrinque sparse setulosis membranaceis, paniculis terminalibus opposite ramosis divaricatis, floribus parvis paucis, calycibus tomentosis et glanduloso-setosis dentibus abbreviatis.—Affinis *Tschudya rufescenti*, (DC.) sed folia latiora plurinervia. Bacca 5-locularis. Semina *Clidemiæ elegantis.*—British Guiana. Schomburgk, n. 402.

This species, with four or five W. Indian ones in my herbarium, have the habit attributed to *Tschudya;* but I have never found the remarkable point to the seed, figured by De Candolle. At any rate the seeds of *Clidemia* are too variable in form, especially when dried before maturity, for me not to agree with Martius in uniting *Tschudya* with *Clidemia.*

370. C. (*Paniculatæ*) *campestris* (sp. n.); ramis subteretibus inflorescentia foliisque subtus tomento rufo stellato obtectis, foliis petiolatis lanceolato-ovatis acutis basi subcordatis 5-7-nerviis margine minute serrulatis, junioribus ciliatis supra rugosis pube stellato scabris, panicula terminali divaricata, ramis vix setulosis, floribus ad apices ramorum subternatim approximatis, calycibus ovatis rufo-tomentosis dentibus brevibus ovatis obtusis dorso breviter mucronatis.—Frutex 4-5-pedalis. Rami paniculæ oppositi divaricati nunc apice 3-5-flori, floribus omnibus sessilibus, nunc umbellati, flore centrali sessili, ramis lateralibus apice 1-3-floris. Tomentum floccosum. Folia 3-4-pollicaria subpustulata. Flores pentameri albi. Calycis dentes subduplicati, exteriores brevissimi, interiores obovati. Ovarium ultra medium adnatum, apice breviter hispidum, 5-loculare.—Moist Savannahs, British Guiana. Schomburgk, n. 478.—This is evidently near *Leandra dubia* (DC.), but specifically different.

β. *pauciflora;* floribus paucis densius paniculatis v. glome-

ratis, setis v. nisi in ovario subnullis.—British Guiana. Schomburgk, n. 961.—Some of the specimens come very near to *Melastoma biglomeratum* (Bonpl.) placed by De Candolle in *Miconia*, but which appears rather to be a *Clidemia*.

371. C. (*Paniculatæ*) *radulæfolia* (sp. n.); ramis teretibus, petiolis inflorescentiaque setis confertis subadpressis dense hirsutis, foliis oblongis acuminatis vix serrulatis basi angustatis 3-5-nerviis, nervis superioribus a basi distantibus, supra strigis brevibus densis e pustula ortis asperrimis, subtus hirsutis, paniculæ terminalis ramis oppositis apice flores confertos gerentibus bracteis ovato-orbiculatis intermixtis.—Affinis ex descr. *C. bracteatæ*, *mutabili* et *lappaceæ*. Folia 4-6-poll. longa. Bracteæ calyce dimidio breviores, extus setoso-hispidissimæ, intus glabræ. Flores 5-meri. Calyces setoso-hispidissimi, dentibus brevibus duplicatis, interioribus obovatis membranaceis, exterioribus setosis. Petala oblongo-spathulata. Stigma obtusum.—British Guiana, (Expedition to the Rio Negro). Schomburgk, n. 998.

372. C. (*Paniculatæ*) *desmantha* (sp. n.); ramulis subteretibus paniculisque tomento rufo stellato subfloccoso denso obtectis setisque paucis hinc inde munitis, foliis breviter petiolatis oblongis acuminatis subintegerrimis basi rotundatis areolato-rugosis utrinque præsertim subtus pube stellata demum evanida tomentellis, paniculæ ramis paucis oppositis, floribus parvis dense globoso-glomeratis, calycibus demum glabratis dentibus brevissimis subduplicatis, ovario breviter adnato stellato setoso.—Folia 3-5-poll. longa. Bracteæ lineari-lanceolatæ rufo-tomentosæ demum in glomerulis florum reconditæ. Calyces vix lineam longi. Setarum fasciculi in ovario numerosi seriati. Loculi ovarii 5. Fructus non vidi.—Pedrero. Schomburgk, n. 884.

Gardner's n. 223, 384, and 387, and Cuming's n. 1258, are *Clidemiæ*, of the group of *Paniculatæ*, to which I should also refer *Leandra sylvestris* (DC.) and other *Leandræ* with paniculate flowers and small bracts. *L. involucrata* (DC.), *L. villosa*, DC. (to which belong Gardner's 382 and 383), *L. scabra* (DC.), and a few others, may be considered as form-

ing a fifth group of *Clidemiæ*, with paniculate flowers and large imbricate bracts. These *Involucratæ* have also generally the teeth of the calyx much more duplicate than in the greater number of the *Clidemiæ*.

The *Niangæ* (of DC.) form a very natural section, to which I should refer Gardner's n. 38, 385 and 386, Cuming's n. 1180, and Mathews n. 1718.

The *Secundifloræ* (among which is included Gardner's n. 1607), especially the two following species, are in many respects nearer to *Miconia* than to *Clidemia;* although, on account of their rigid hairs, and especially the setæ on the ovary, I have thought it safer to leave them in *Clidemia.*

373. C.? (*Secundifloræ*) *miconioides*, (sp. n.); ramis teretibus inflorescentia petiolisque pilis rufis patentibus hirsutissimis, foliis breviter petiolatis ovali-oblongis v. lanceolato-ovatis acuminatis plerisque denticulatis margine ciliatis basi rotundatis 3-5-nerviis, supra glaberrimis v. marginem versus sparse setulosis, subtus præsertim ad venas rufo-hirsutis, paniculæ terminalis v. demum lateralis ramis oppositis 2-3-furcatis, floribus sessilibus secundis.—Folia 3-6-poll. longa, membranacea. Bracteæ parvæ. Flores parvi 5-meri. Calyx hispidus ovatus, dentibus ut in *Miconiis* membrana interna subcontinua auctis. Petala ovato-oblonga, obtusa, patentia. Antheræ longiuscule rostratæ, basi biauriculatæ. Ovarium setarum annulo coronatum, semi-adhærens. Stigma peltatum. Bacca exsicca, trilocularis.—Pirarosa. Schomburgk, n. 739. His n. 8, in some of the earlier sets, appears to be the same plant with the inflorescence less developed. In the later sets, n. 8 is *Miconia rubiginosa.*

374. C.? (*Secundifloræ*) *maculata* (sp. n.); ramis teretibus, foliis utrinque inflorescentia calycibusque pilis rigidis patentibus hirsutis pube brevissima stellata plus minusve intermixta, foliis breviter petiolatis oblongo-ovatis obtuse acuminatis basi rotundatis 5-nerviis margine sæpius dentatis, paniculæ terminalis ramis oppositis apice divaricato-ramosis sessilibus secundis glomeratisve.—Folia 3-4 poll. longa, rugosa. Bracteæ parvæ. Flores fere præcedentis parvi

5-meri. Dentes calycini subsimplices, brevissimi. Petala lato-ovata, brevia, flavescentia, macula fusca notata. Ovarium triloculare disco coronatum apice brevissime nonnunquam vix conspicue setosum. Stigma peltatum. Bacca subexsicca, trilocularis.—British Guiana, (Expedition to the Rio Negro). Schomburgk.

375. Miconia (*Leiosphæria*) *eriopoda* (sp. n.); ramulis obtuse tetragonis glabris, junioribus ad nodos petiolisque supra rufo-lanatis, foliis breviter petiolatis ovatis acuminatis crenulatis ciliatis basi subcordatis 5-nerviis membranaceis utrinque sparse setosis, paniculæ divaricatæ ramis subfloccosis, floribus sessilibus glomeratis.—Folia 3-4 poll. longa, utrinque viridia. Bracteæ parvæ ovatæ. Calyces ovoidei, virides, læves v. vix minute et sparse setulosi, dentibus 5 brevissimis membrana brevi subcontinua intus auctis. Stigma subcapitatum. Ovarium disco glaberrimo coronatum.—British Guiana. Schomburgk, n. 493.—This species connects the *Clidemiæ maculata* and *miconioides* with the sections *Leiosphæria* of *Miconia*.

376. M. (*Leiosphæria*) *ciliata*, *DC. Prod.* III. *p.* 179. —British Guiana. Schomburgk, n. 418. French Guiana. Leprieur, Herb. Par. n. 34.

377. M. (*Leiosphæria*) *racemosa*, *DC. Prod.* III. *p.* 179. —French Guiana. Leprieur, Herb. Par. n. 70.—These two are perhaps mere varieties of one species.

378. M. (*Eriosphæria*) *aplostachya*, *DC. Prod.* III. *p.* 183. —British Guiana. Schomburgk, n. 871.

Gardner's n. 1006 from Pernambuco is a new species allied to this one, but with larger flowers and large broad leaves.

379. M. (*Eriosphæria*) *fallax*, *DC. Prod.* III. *p.* 181.—Flowers larger and more condensed than in *M. holosericea*. —British Guiana. Schomburgk, n. 613, also in a few sets, 1063.—Ceará, Gardner, n. 1605.

380. M. (*Eriosphæria*) *holosericea*, *DC. Prod.* III. *p.* 181. —British Guiana. Schomburgk, n. 1063, in most sets. French Guiana. Leprieur, Herb. Par. n. 71. Alagoas,

Gardner, n. 1289. Ceará, Gardner, n. 1604. Peru, Mathews, n. 1296, and in almost every Brazilian collection.

Var. *obtusifolia*. British Guiana. Schomburgk, n. 259.

381. M. (*Eriosphæria*) *argyrophylla, DC. Prod.* III. *p.* 181.—Leaves larger and broader than in *M. holosericea*; inflorescence much less branched; flowers rather smaller, secund. —Pedrero, Schomburgk, n. 925.

382.—M. (*Eriosphæria*) *Schomburgkii* (sp. n.); ramulis compressis petiolis inflorescentia foliisque subtus pube brevissima subnitente fulvis, foliis petiolatis amplis ovatis ellipticisve acuminatis integerrimis basi rotundatis 3-5-nerviis supra glabris, thyrso paniculato terminali, ramis oppositis, floribus sessilibus secundis, calycibus campanulatis striatis.—Folia fere *Diplochitæ*, inflorescentia et flores omnino *Miconiæ*. Calyces 1 lin. longi. Petala parva obovata. Antheræ graciles obtusiusculæ vix rostratæ uniporosæ.—Rio Padawire, Schomburgk, n. 1020.

383. M. (*Eriosphæria*) *rubiginosa, DC. Prod.* III. *p.* 183. British Guiana, Schomburgk, a single specimen from Rio Parime, also n. 8 in some of the latter sets.

384. M. (*Eriosphæria*) *macrothyrsa* (sp. n.); ramis subteretibus inflorescentia nervisque foliorum paginæ inferioris tomento denso rufo subfloccoso obtectis, foliis brevissime petiolatis lato-ovatis superne denticulatis basi cordatis 7-nerviis supra margineque junioribus hispidulis subsetosis, adultis glabratis lævibus, subtus tomento brevi denso albido-rufis, thyrso elongato, ramis oppositis brevibus, floribus sessilibus seriatis subcongestis, calycibus dense rufo-tomentosis.—Folia 4-6-pollicaria. Alabastra subglobosa. Calyces florigeri ovati $1\frac{1}{2}$ lin. longi, dentibus brevibus ovatis, membrana interna vix conspicua. Antherarum auriculæ majusculæ. Stylus longe exsertus. Ovarii discus cupulatus, setis nullis, loculi tres. Savannahs, British Guiana. Schomburgk, n. 398.

385. M. (*Eriosphæria*) *rufescens, DC. Prod.* III. *p.* 180. —Savannahs, British Guiana. Schomburgk, n. 393.—The same species occurs in Mathews' Moyabamba collection.

Gardner's nos. 183, 391, and 395, and Mathews' nos. 1263, 1299, and 1305, belong to the section *Eriosphæria.* Cuming's n. 1291, is a new species of the section *Eumiconia* belonging to the group of *Sessilifoliæ.*

386. M.? (*Eumiconia*) *nitens* (sp. n.); glaberrima, ramulis teretibus v. junioribus compressis, foliis petiolatis ovato-oblongis v. sublanceolatis obtusis rarius acutiusculis coriaceis integerrimis, præter nervulum marginalem trinerviis, supra lucidis, paniculæ terminalis ramulis oppositis brevibus crassis paucifloris, calycis dentibus brevissimis, ovario triloculari.—This comes very near to De Candolle's character of *M. Martiana* (*Prod.* III. *p.* 186); but the leaves, which are 3-4 inches long, are more of an oblong than a lanceolate form, and almost always blunt. The branches of the panicle are thick, as short or shorter than the calyx, and bear from three to five flowers, nearly as large as, and with something of the appearance of those of *Tococa.* The young fruit adheres above the middle to the thick fleshy calyx, and is surmounted by a remarkably large fleshy convex umbo.—Sandstone regions, British Guiana. Schomburgk.

387. M. (*Eumiconia*) *alata, DC. Prod.* III. *p.* 184.—Fructus, ut in icone *Aubletiana,* trilocularem video.—Rocky wastes, British Guiana. Schomburgk, n. 635.

388. M. (*Eumiconia*) *revoluta* (sp. n.); ramulis compressis inflorescentia petiolisque pube subfurfuracea rufescentibus, foliis petiolatis ovali-ellipticis acuminatis integerrimis margine revolutis basi angustatis 5-nerviis, nervis marginalibus in petiolum decurrentibus, subcoriaceis supra pube minuta stellata scabriusculis, subtus pube pulveracea decidua rufescentibus demum glabratis, panicula divaricata, floribus subsessilibus irregulariter congestis, calycibus extus rufo-pulveraceis, dentibus minimis ovatis obtusis.—Leaves three to four inches long, remarkably stiff.—British Guiana. Schomburgk, n. 1061.

389. M. (*Eumiconia*) *brevipes* (sp. n.); ramulis e tetragone teretibus inflorescentia petiolisque pube fürfuracea rufescentibus, foliis breve petiolatis oblongo-ellipticis v. lanceolato-

ovatis acuminatis basi rotundatis subcordatisve 5-nerviis glabris v. junioribus pube tenui floccosa præsertim subtus conspersis, paniculæ terminalis ramulis divaricatis floribusque subfasciculatis, calycibus pube stellata decidua conspersis dentibus brevibus ovatis.—Affinis *M. Guayaquilensi* sed folia minora angustiora brevius petiolata, flores minores. Antheræ obtusæ uniporosæ.—Savannahs on the skirts of woods, British Guiana. Schomburgk.

390. M. (*Eumiconia*) *pteropoda* (sp. n.); ramulis e compresso-teretibus inflorescentia petiolisque pube brevissima subpulveracea canescentibus, foliis breviter petiolatis amplis ovato-ellipticis acuminatis subrepandis basi rotundatis et in petiolum longe decurrentibus supra basin quintuplinerviis, superne minute punctato-puberulis glabrisve subtus ad nervos pulveraceis demum glabratis, panicula laxa divaricata, floribus sessilibus glomeratis, calycibus ovato-urceolatis subcostatis pulveraceo-tomentosis, dentibus brevibus obtusis.—Folia sæpe disparia, majora 6-8 poll. longa. Flores mediocres.—British Guiana. Schomburgk.

391. M. (*Eumiconia*) *collina*, *DC. Prod.* III. *p.* 185.—French Guiana. Leprieur, Herb. Par. n. 72.—The *Melastoma lævigata*, figured by Aublet (*Pl. Guian. t.* 159), and referred by De Candolle to *Miconia microcarpa*, appears to be the same as the plant before me, which agrees precisely with the Porto-rico specimens upon which *M. collina* was founded.

392. M. (*Eumiconia*) *myriantha;* ramulis e compresso-teretibus inflorescentia petiolis nervisque subtus tomento brevissimo subfurfuraceo demum deciduo rufescentibus, foliis petiolatis oblongis longe et anguste acuminatis integerrimis 3-5-nerviis basi obtusis subtus vix tomento tenuissimo pallidis glabrisve supra glabris, panicula multiflora laxiuscula, calycis tubo ovato-globoso subfurfuraceo ecostato, limbi decidui dentibus brevissimis acutiusculis.—Evidently near *M. urophylla* (DC.) It also resembles in habit the *Cremanium minutiflorum*, and some Brazilian *Chænopleuræ.*—British Guiana. Schomburgk, n. 507.

Gardner's nos. 394, 402, and 1010, (the same species as 37,) and Mathew's nos. 1265, 1268, 1298, 1302, 1720, and 1724, appear to be all referrible to *Eumiconia.* Gardner's nos. 393 and 397 belong to *Oxymeris;* 396 and 1602 of the same collector, and several of Mathews' seem to be *Cremania;* but the distinction in these cases between the uniporose and biporose anthers is so nice, as to be scarcely determinable from dried specimens. Cuming's n. 1257 is a *Conostegia.*

TRIBE V. CHARIANTHEÆ.

There are but two American genera known in this tribe; *Charianthus,* which bears handsome tetramerous, purple or red flowers in loose somewhat corymbose panicles; and *Chænopleura,* with a habit so exactly that of several *Miconiæ,* as only to be recognisable by the inspection of the anthers.

393. *Chænopleura hypoleuca* (sp. n.); ramulis compressis inflorescentia petiolisque tomento brevissimo denso-albidis v. subrufescentibus, foliis amplis ovatis ellipticisve breviter acuminatis margine subdentatis basi rotundatis 5-nerviis subcoriaceis adultis supra glabris subtus tomento denso albis subrufidisve, panicula terminali, ramis divaricatis trichotomis.—Frutex. Folia 6-10 poll. longa, juniora supra tomento cito deciduo obtecta. Flores numerosi. Calyx floriger ovato-turbinatus $\frac{3}{4}$ lin. longus brevissime 5-dentatus, extus albo-tomentosus, fructifer globosus 1 lin. longus. Petala 5 ovata, calyce duplo longiora. Stamina 10. Antheræ ovatæ, loculis rima longitudinali dehiscentibus, connectivo basi elongato, cum filamento subcontinuo brevissime biauriculato. Ovarium adnatum, disco dentato coronatum. Fructus subsiccus indehiscens, calyci adnatus, 4-5-locularis. Semina trihedra, hilo lineari.—British Guiana. Schomburgk, n. 392; also Panamá. Cuming, n. 1271.

Gardner's n. 399, 400, and 401 from the Organ Mountains, and Mathews' n. 1291 from Peru, are so many new species of *Chænopleura.*

MOURIRIACEÆ.

394. Mouriria *Guianensis, Aubl.—DC. Prod.* III. *p.* 7.—British Guiana. Schomburgk, n. 201.

395. M. *brevipes, Hook. Journ. Bot.* II. *p.* 24.—British Guiana. Schomburgk, n. 690.

LYTHRARIEÆ.

396. Cuphea *Melvilla, Lindl.—DC. Prod.* III. *p.* 84.—British Guiana. Schomburgk, n. 815.

397. C. *rigidula* (sp. n.); fruticosa, ramulis dense et rigide hispidis, foliis oblongo-lanceolatis utrinque angustatis supra adpresse strigosis subtus glabris v. ad nervos et margine longe ciliatis, floralibus parvis ovatis bracteæformibus, racemis terminalibus flexuosis dichotome ramosis hispidis, floribus breviter pedicellatis, calyce postice breviter et obtuse calcarato, petalis sex parum inæqualibus, staminibus 11 inclusis, filamentis basi pilosis, ovulis circa 10.—Forte *C. parvifloræ* (Hook.) affinis, at foliis et inflorescentia diversa. Flores parvi. Calyx per anthesin 2 lin., fructifer 3 lin. longus. Petala 2 ungue intense colorato lamina vix breviora, 4 oblonga concoloria breviter unguiculata.

398. C. *micrantha, Humb. et Kunth.—DC. Prod.* III. *p.* 83.—Savannahs, Pirarara. Schomburgk, n. 808. French Guiana. Leprieur, Herb. Par. n. 67.

399. C. *antisiphylitica, Humb. et Kunth.—DC. Prod.* III. *p.* 87.—British Guiana. Schomburgk, n. 77, and in some sets n. 617.—β. *acutifolia,* foliis acutissimis basi subcordatis. Moist savannahs of the Upper Rupunoony. Schomburgk.

ONAGRARIEÆ.

400. Jussiæa *affinis. DC. Prod.* III. *p.* 53.—On the Essequibo and Rupunoony, Schomburgk, n. 308.

401. J. *octonervia, Lam. DC. Prod.* III. *p.* 57.—French Guiana, Leprieur, Herb. Par. n. 91.

402. J. *acuminata, Sw.—DC. Prod.* III. *p.* 54.—On the Quitaro. Schomburgk, n. 570. French Guiana, Leprieur.

Herb. Par. n. 90.—It is also Gardner's n. 998, from Pernambuco, and occurs in several West Indian and North Brazilian collections.

403. J. *nervosa, Poir.—DC. Prod.* III. *p.* 56.—Swampy savannahs, British Guiana. Schomburgk, n. 438, and in some of the later sets n. 61. In the earlier sets, Schomburgk's n. 61 is a much narrower-leaved variety or allied species, with the same flowers and fruit as in the more common *J. nervosa;* possibly it may be *J. Maypurensis,* (*Humb. et Kunth.*)

404. J. *latifolia* (sp. n.); herbacea, glabra, foliis ovatis utrinque acuminatis brevibus petiolatis, floribus breviter pedicellatis, bracteis minutis v. nullis, calycis tubo ovoideo subangulato, laciniis 4 lato-lanceolatis petala superantibus.—Capsula ovoidea 5 lin. longa, apice constricta nec, ut in speciebus brachycarpis plerisque, turbinata.—British Guiana. Schomburgk.

MYRTACEÆ.

405. Psidium *polycarpon;* ramulis hirsutis subcompressis, foliis petiolatis obovatis oblongisve obtusis v. vix acuminatis basi cuneatis utrinque pubescentibus, pube subtus sericea demum velutina, pedunculis axillaribus trifloris calycibusque villosis, ovario ovoideo alabastro obtusissimo, calycis limbo demum 5-partito coriaceo.—*P. polycarpon, Lamb. Act. Soc. Linn.* XI. *p.* 231. *DC. Prod.* III. *p.* 235.—Folia 3—4-pollicaria, nunc obtusissima, nunc fere acuta. Pedunculi 6—10 lin. longi. Bracteolæ anguste lineari-lanceolatæ. Calycis laciniæ obtusissimæ. Ovarium 4—5 loculare.—Arid savannahs near Pirarara on the Rupunoony. Schomburgk, n. 636; also Panama, Cuming, n. 1273.—This species is evidently allied to *P. pomiferum,* and to *P. pyriferum;* but is much more downy, and the buds are remarkably obtuse, whereas they appear to be always more or less pointed in the two others. It differs from De Candolle's character of *P. hians,* by the peduncles being always three-flowered, though sometimes accompanied by a second one-flowered pedicel from the same

axilla, and by the leaves which are generally cuneate at the base, and from that author's character of *P. rufum*, by the inflorescence. Judging by an old cultivated specimen without a name, I suspect this may be the *P. fragrans* of garden catalogues, which I do not however find described. The nos. 1021 and 1609 of Gardner's collection, and a Bahia specimen from Salzmann, are very much like the *P. polycarpon*, but the flowers are rather larger and the bud less obtuse.

406. P. *pyriferum*, *Linn.—DC. Prod.* III. *p.* 233, var. *glabrum.*—British Guiana. Schomburgk.

407. P. *aromaticum*, *Aubl.—DC. Prod.* III. *p.* 233.—Folia ut in icone Aubletiana (*t.* 191), eroso-denticulata.—British Guiana. Schomburgk.

408. P. *turbiniflorum*, *Mart. in DC. Prod.* III. *p.* 234?—Folia demum glabrata. Pedicelli solitarii v. bini, longitudine variabiles, sæpe vix 4 lin. longi. Bracteolæ lineari-subulatæ. Cætera omnia ut in diagnosi Candolleana. Fructus globosus 4—5 lin. diametro.—Savannahs of the Rupunoony. Schomburgk, n. 634.

409. P. *ciliatum* (sp. n.); ramulis subcompressis hirtellis, foliis subsessilibus ovato-oblongis utrinque acuminatis rarius basi obtusis utrinque glabris junioribus margine ciliatis, pedunculis 1—2-floris, ovario breviter turbinato, alabastro depresso-globoso, calyce late 5-lobo ciliato demum profundius fisso.—Frutex bipedalis. Folia 1½ poll. longa. Pedicelli compressi 6—15-lin. longi. Bracteolæ lanceolatæ ciliatæ. Calyces glabri.—Dry savannahs, British Guiana. Schomburgk.

410. P. *parviflorum* (sp. n.); ramulis teretibus v. vix tetragonis hirtellis demum glabratis, foliis subsessilibus ovali-oblongis acutis v. obtusis basi obtusis cordatisve junioribus utrinque puberulis, adultis supra glabris, pedunculis unifloris hirtellis, ovario ovoideo, alabastro obtuso glabriusculo, calyce demum inæqualiter fisso.—Folia 1—1½ poll. longa. Pedunculi 6—8 lin.—On the Essequibo and Rupunoony. Schomburgk, n. 110.

411. P. *aquaticum* (sp. n.); ramulis teretibus hirtellis,

foliis sessilibus ovato-ellipticis obtusis basi cordatis utrinque præsertim ad venas hirtellis, pedunculis unifloris hirtellis, ovario oblongo-obovoideo striato, calyce irregulariter fisso.—Folia et flores duplo majora quam in præcedente.—British Guiana. Schomburgk, n. 191, under the name of the *Water Guava.*

412. Campomanesia *glabra* (sp. n.); tota glabra, foliis ovatis breviter acuminatis basi obtusis supra nitidis, pedunculis unifloris folio dimidio brevioribus, inferioribus aggregatis aut ramosis.—Folia circa 3 poll. longa, 1½ poll. lata. Calycis lobi late ovati obtusissimi in alabastro jam patentes, sinu obtuso separati. Flores ampli. Stigma peltato-capitatum. Ovarium 4-loculare, loculis pluri-ovulatis.—On the Essequibo. Schomburgk, n. 2.

413. Calyptranthes *obtusa* (sp. n.); tota glabra, foliis subsessilibus ovatis obtusis basi rotundatis rarius subcordatis junioribus pellucido-punctatis demum coriaceis opacis, pedunculis 1—3 terminalibus divaricato-ramosis, flore terminali sessili, alabastro globoso obtusissimo.—*C. Suzygio* affinis, folia tamen latiora, sessiliflora, et alabastra non acuminata.—Tree of 30 feet high, with very hard wood, known by the name of *Cowaco.*—British Guiana. Schomburgk, n. 486.

414. Caryophyllus *aromaticus*, *Linn.*—French Guiana, Herb. Par. n. 37.

415. Eugenia (*Glomeratæ*) *divaricata* (sp. n.); glabra, foliis breviter petiolatis ovatis acuminatis basi rotundatis pellucido-punctatis, venis crebris tenuibus juxta marginem confluentibus, floribus axillaribus confertis breviter pedicellatis, bracteolis sub calyce orbiculatis in cupulam connatis, calycis glabri lobis brevissimis orbiculatis ciliatis parum inæqualibus, "fructu oblongo."—Folia 2—2½ poll. longa, 1—1¼ poll. lata. Pedicelli vix 1 lin., calyx fere 2 lin. longi. Bacca, teste Schomburgkio, magnitudine fructus *Oleæ.*—On the Rio Negro. Schomburgk, n. 958.—Probably near *C. malpighioides, DC.*

416. E. (*Glomeratæ*) *Salzmanni* (sp. n.); glabra v. in partibus junioribus vix puberula, foliis breviter petiolatis

ovato-oblongis longe acuminatis basi rotundatis v. vix angustatis pellucido-punctatis, venis crebris tenuibus juxta marginem confluentibus, floribus axillaribus confertis subsessilibus, bracteis sub calyce orbiculatis brevissimis subconnatis, calycis glabri lobis 4 brevibus orbiculatis vix ciliatis parum inæqualibus, fructu parvo globoso.—Folia 1½—2½ poll. longa. Flores multo minores quam in præcedente. Bacca (in specimine Salzmanniana) magnitudine *Pisi communis.*—Affinis *E. cascarioidi*, a qua differt petiolis longioribus, floribus minoribus sessilioribus, bractearum forma; ab *E. campestri* differre videtur foliis basi vix angustatis glabris tenuioribus et longius acuminatis. An eadem ac *E. campestris* (β. *venulosa*), *Mart. Herb. Bras. p.* 87. n. 55?—On the Rio Branco. Schomburgk, n. 780. Also Bahia, Salzmann, under the name of *Myrtus verticillata.*

417. E. (*Glomeratæ*) *vismeæfolia* (sp. n.); glabra, foliis brevissime petiolatis ovali-oblongis sublanceolatisve acuminatis acutisve margine subrevolutis basi rotundatis subcordatis pellucido-punctatis subcoriaceis, venis crebris tenuibus prope marginem confluentibus, floribus axillaribus confertis subsessilibus, bracteolis sub calyce brevissimis, calycis glabri lobis 4 orbiculatis vix ciliatis.—Folia 3-4 poll. longa, 1-1½ poll. lata, supra nitidula subtus pallida subrorulenta.—Affinis videtur *E. sessilifloræ.*—Rio Quitaro, Schomburgk.

418. E. (*Axillares*) *subalterna* (sp. n.); foliis alternis v. vix oppositis sparsisve obovato-oblongis late et retuse subacuminatis basi angustatis pellucido-punctatis utrinque ramulisque minute glanduloso-puberulis, pedicellis 1-3 axillaribus unifloris petiolo vix longioribus, bracteis bracteolisque minutis obtusis.—Folia sesquipollicaria venis utrinque prominentibus reticulatis. Pedicelli 2-3 lin. longi. Calycis lobi 4 orbiculati, 2 parum minores.—Savannahs of the Rupunoony. Schomburgk, n. 634.

419. E. (*Axillares*) (sp. n.?) E. *sanctæ* et E. *Coarensi* affinis.—Folia 9-12 lin. longa, ovata v. ovali-oblonga, obtusissima v. retusa, etsi nonnunquam brevissime et late acuminata, basi angustata v. rotundata, pellucido-punctata, glaberrima.

Ramuli juniores puberuli, demum glabrati. Pedicelli solitarii, rarius bini, 3-4 lin. longi. Calycis lobi 4 orbiculati breves. Bacca subglobosa 1-2-sperma, calyce coronata. Semen grossum, cotyledonibus conferruminatis.—Savannahs, Pirarara. Schomburgk, n. 733.

420. E. (*Axillares*) *leptantha* (sp. n.); ramulis pedicellisque rufo-puberulis, foliis parvis obovatis obtusis retusisve basi angustatis utrinque glabris subaveniis subopacis, pedicellis e pedunculo communi brevissimo pluribus tenuibus folio brevioribus, bracteolis sub flore orbiculatis, calycis tubo albo pubescente, limbi laciniis 4 orbiculatis.—Folia semipollicaria. Flores parvi. Bracteæ et laciniæ calycinæ glabriusculæ ciliatæ, fere petaloideæ.—Barcellos on the Rio Negro. Schomburgk, n. 921.

421. E. (*Axillares*) *incanescens* (sp. n.); ramulis pubescentibus, foliis petiolatis oblongo-ellipticis lanceolatisve obtuse acuminatis basi rotundatis angustatisve utrinque pubescentibus, pedicellis axillaribus terminalibusque fasciculatis petiolo 2-3-plo longioribus, calycibus cano-pubescentibus, bracteis lanceolatis, bracteolis subflore ovato-lanceolatis, calycis laciniis 4 lato-ovatis submucronatis.—Folia 2 poll. longa. Pedicelli 2-4 lin. Bacca, teste Schomburgkio, rubra.—Banks of the Rupunoony, Schomburgk, n. 726.

422. E. (*Axillares*) *Schomburgkii* (sp. n.); glabra, foliis ovato-lanceolatis v. oblongis obtuse acuminatis basi rotundatis v. vix angustatis pellucido-punctatis, pedicellis pluribus axillaribus vix petiolo longioribus unifloris bibracteolatis, calycis lobis 4 ovatis subacutis.—I should have taken this for the *E. flavescens* (DC.), were it not that Gardner's n. 1617 from Ceará, certainly a distinct species from this one, answers rather more precisely to the diagnosis of the *Prodromus*. Both species are remarkable by their flowers drying yellow, though white when fresh. The leaves also in both are apt to acquire a yellowish hue in drying. The *E. Schomburgkii* has, however, longer, narrower and coriaceous leaves, with shorter and thicker pedicels than Gardner's plant.—On the Currassawaak, near the Rupunoony, Schomburgk, n. 703.

423. E. (*Racemosæ*) *Egensis, DC. Prod.* III. *p.* 281.—Racemi pedunculus communis nunc vix 1-2 lin. nunc ultra pollicem longus.—On the Rio Negro, Schomburgk, n. 943.

424. E. (*Racemosæ*) *xylopifolia, DC. Prod.* III. *p.* 279.—On the Rio Quitaro, Schomburgk, n. 546.

425. E. (*Racemosæ*) *polystachya, Rich.—DC. Prod.* III. *p.* 280.—British Guiana, Schomburgk, n. 691.

426. E.? (*Paniculatæ*) *nitida* (sp. n.); foliis breviter petiolatis ovatis acuminatis basi rotundatis subcordatisve crassis coriaceis supra nitidis subtus junioribus ramulisque cano-pubescentibus v. demum glabratis raro pellucido-punctatis, racemis axillaribus subpaniculatis, ramis paucis petiolisque albo-pubescentibus, floribus sessilibus, calycis dentibus 4 orbiculatis valde inæqualibus.—Folia 2-3½ poll. longa.—On the banks of the Essequibo and Rupunoony. Schomburgk, n. 130 and 319.

427. E.? (*Paniculatæ*) *pyrifolia* (*Desv.—DC. Prod.* III. *p.* 285?); foliis breviter petiolatis ovatis v. ovato-oblongis longiuscule et obtuse acuminatis, adultis opacis glabris, paniculis binis terminalibus folio longioribus, ramis divaricatis rachique pubescentibus, floribus sessilibus, bracteis minutis, calyci albo-villosi dentibus 4 orbiculatis valde inæqualibus.—Folia 1½-2½ poll. longa.—High banks of the Rio Negro, Schomburgk, n. 964.

428. E.? (*Paniculatæ*) *Quitarensis* (sp. n.); foliis breviter petiolatis ovatis acuminatis basi rotundatis crassis coriaceis pellucido-punctatis, ramulisque glabris, racemis paniculatis divaricato-ramosis axillaribus terminalibusque glabris v. pilis minutis rufo-puberulis, floribus sessilibus, calycis glabri dentibus 4 orbiculatis valde inæqualibus.—Folia fere *E. nitidæ*, sed glabra. Inflorescentia et flores *E. pyrifoliæ.*—Banks of the Rio Quitaro, Schomburgk, n. 547.

429. E.? (*Paniculatæ*) *subobliqua* (sp. n.); foliis petiolatis oblongo-lanceolatis subobliquis acuminatis basi angustatis pellucido-punctatis glabris v. subtus ad venas puberulis, racemis in axillis supremis paniculatis folio sublongioribus, ramis divaricatis rachique ferrugineo-pubescentibus, floribus

sessilibus, bracteis parvis acutis, calycis dentibus 4 orbiculatis valde inæqualibus, fructu globoso.—Folia 4-6-poll. longa, 1-2 poll. lata. Panicula ampla floribunda.—Species forte *E. patenti* (Poir.) affinis. Inflorescentia *E. pyrifoliæ.*—Hiawa falls on the Essequibo and on the Quitaro. Schomburgk, n. 597.

The four last *Eugeniæ* and some species of the *Prodromus*, have the inflorescence and habit of *Myrcia*, but the divisions of the calyx and the petals are only four in number. They agree with each other in the sessile flowers, and very irregular calyx and corolla; the fruit is but little known. It is probable that when the old genus *Myrtus* is again worked up from sufficient specimens, that the distinction between *Eugenia* and *Myrcia* may be established on characters more conformable to habit than at present; in which case the really paniculate *Eugeniæ* will be either transferred to *Myrcia*, or established as a distinct genus.

430. Myrcia *splendens, DC. Prod.* III. *p.* 244.—Common about old settlements in British Guiana, where it is known by the name of *Ebbebenara*, and the fruit is eaten by Creepers and Manakins. Schomburgk, n. 454.—This fruit is black, according to Schomburgk; but described as red in the W. Indian *M. splendens*, (DC.); and white, spotted with red, according to Aublet, in his *Eugenia Mini*. The leaves are larger and more reticulate in my W. Indian plant than in Schomburgk's, but of an intermediate size in a Porto Rico specimen I possess. Gardner's n. 1623 from Ceará closely resembles Schomburgk's plant, but is smoother. There seems to be a common and very variable species, to which all these plants, as well as *M. ambigua*, *M. pseudomini*, and perhaps some others of the *Prodromus*, may be referred.

431. M. *multifolia, DC. Prod.* III. *p.* 244?—Pedrero, on the Rio Negro, Schomburgk, n. 872.—Perhaps a new species; but the determination of the *Myrciæ* will be very difficult, until they shall have been carefully worked on by some able monographist.

432. M. (sp. n.?); foliis fere *Eugeniæ Sinamariensis* (*Aubl.*)

sed floribus subpaniculatis quinquefidis.—Parime chain, Schomburgk.

433. M. *prunifolia, DC. Prod.* III. *p.* 253.—Dry Savannahs, Pirarara. Schomburgk, n. 732. Also Pernambuco, Gardner, n. 1015.

434. M. *subcordata, DC. Prod.* III. *p.* 253.—In omnibus cum diagnosi Candolleano convenit, nisi foliis etiam junioribus glaberrimis. Ramuli juniores uti pedunculi valde compressi.—Near brooks, Roraima. Schomburgk.

435. M. *hebepetala, DC. Prod.* III. *p.* 246, vel species nova ei valde affinis. Folia adulta coriacea pellucido-punctata, supra glabra subtus sericeo-pubescentia. Flores in genere magni. Calyces utrinque denso rufo-sericei, lobis 5 orbiculatis. Petala extus dense sericea.—Rio Quitaro, Schomburgk, n. 548.

436. M. *ferruginea, DC. Prod.* III. *p.* 245.—Near Roreima. Schomburgk.

437. Lecythis *grandiflora, Aubl.—DC. Prod.* III. *p.* 291.—British Guiana. Schomburgk, n. 286.

438. L. *longipes, Poit.—DC. Prod.* III. *p.* 292.—French Guiana. Herb. Par. n. 1.

439. Bertholletia *excelsa, Humb. et Bonpl.—DC. Prod.* III. *p.* 293.—British Guiana, Schomburgk. Leaves marked A in the sets distributed.

XVIII.—*Remarks on Cambogia Gutta, (Linn.); Stalagmitis Cambogioides, (Murray); and on Laurus Cassia, (Linn.) By* Robert Wight, M.D.

Two subjects of botanical inquiry, both of considerable interest, have recently engaged my attention; and as the conclusions at which I have arrived are somewhat different from what I anticipated at the outset, I think a summary of the results may not be uninteresting to your botanical readers. The first of these subjects was the examination, for my *Illustrations of Indian Botany*, of the Natural Order *Guttiferæ;* with

the purpose of marking out its limits and elucidating its Indian genera and species. The second was an endeavour to ascertain the *Laurus Cassia* of Linnæus, and the tree which furnishes the Cassia-bark, or *Cassia lignea*, of commerce; undertaken by order of Government, with a view to solve a question submitted for consideration by the Ceylon Government. I shall commence my present remarks with the *Guttiferæ.*

In the 13th number of the Madras Journal of Science I published some observations on the genera of this Order, elicited by a communication of Dr Graham respecting the *Gamboge plant* of Ceylon. In that paper I showed that the genera *Garcinia* and *Cambogia* of Linnæus were the same; and that *Stalagmitis* of Murray was, so far as could be ascertained from characters only, identical with Roxburgh's *Xanthochymus.* Conceiving the genus *Garcinia* too complex, I there proposed subdividing it. The following extract will explain the views I then entertained:—

"In my opinion, the genus *Garcinia*, as now constituted, ought not to be retained; and a glance at the accompanying figures will explain my reasons for thinking so, by exhibiting in one view several of the incongruities which it presents. For example, the *Garcinia Mangostana, speciosa*, and *cornea*, have the filaments of the male flower united, forming four large fleshy bodies covered with anthers; and two of those three species are known to bear a globose, not sulcated fruit. These might form the type of a genus under Rumphius' original name, *Mangostana.*—*G. Cambogia* has the stamens of the male flower ranged in a single row,* round a disk-like receptacle, with a sulcated fruit. This might constitute the type of a second genus; for which, as nearly corresponding with the character assigned by Linnæus to his *Garcinia*, that name might be retained.—In *G. Kydia, Zeylanica, pedunculata, paniculata* and *affinis*, the filaments are united into a staminal

* This I now find is an error; Roxburgh, when he prepared the figure of his *Garcinia Cambogia*, was unacquainted with the male flower, and only represents the bi-sexual one.

column, terminating in a head covered with anthers; and the fruit is usually furrowed. These might form a third genus, retaining the vacant name of *Cambogia:*—and lastly, *G. pictoria*, Roxb. (*Mangost. Morella*, Gært.?); G. *elliptica*, Wall. (*fid.* Graham) and Dr Graham's Ceylon plant, would make up a fourth, distinguished by their united filaments, and cup-shaped, one-celled, circumscissile anthers; to which the then unappropriated name, *Stalagmitis*, might be given; in preference to disturbing Roxburgh's *Xanthochymus*, now well established, by rigidly enforcing the rule of priority, and restoring that of Murray, thereby causing considerable confusion in the synonymy, which might thus be easily avoided."

Since the appearance of that article, much additional light has been thrown on the subject through the publication, by Dr Graham of Edinburgh in the 2d volume of the *Companion to the Botanical Magazine*, of a paper entitled "Remarks on the *Gamboge-tree* of Ceylon and character of *Hebradendron*, a new genus of *Guttiferæ*, and to which the tree in question belongs."

This is an excellent paper, and, imbodying much very interesting information, well repays the trouble of a careful perusal. I cannot however adopt Dr Graham's conclusions as to the propriety of elevating this plant to the rank of a distinct genus; nor, supposing that abler botanists than either Dr G. or myself consider ourselves, should admit it as such into the system of plants, do I think his name can be sanctioned. The question, whether or not this is the Gamboge plant of Ceylon, I look upon as set at rest by the evidence adduced in Dr G.'s "Remarks." All therefore that I have now to consider are simply the following botanical questions—1st, whether this plant ought to form the type of a genus distinct from *Garcinia?*—and 2d, if so, whether it ought to receive a new name? The first of these questions I answer in the negative, because I do not think it sufficiently distinguished from *Garcinia* by the solitary character assigned—the peculiar structure of the anther. To the second I equally return a negative, because this plant is undoubtedly the type of the

genus *Cambogia* of Linnæus, whose name therefore ought to have been retained. My reasons for the first of these conclusions being fully stated at page 122 and 123 of my *Illustrations*, I subjoin the passage :—

"If the precedent established by Dr Graham in the formation of his genus *Hebradendron* be followed, we may, I fear, soon expect to see the off-sets from *Garcinia* about as numerous as its species now are; since *Hebradendron* is separated on account of a variation in a single point of structure, and without reference to analogous forms met with in other species. The only character in which it differs from *Garcinia*, as defined in our *Prodromus*, is—in having 1-celled circumscissile anthers—while the more usual structure in that genus is to have them two-celled, with introrse, longitudinal dehiscence. Should this be considered a satisfactory reason for its removal, then *G. Kydiana* (Roxb.), which has a four-sided connectivum, with a polleniferous cell in each face, must equally be separated from the genus; as well as another species of which I possess specimens from Mergui, the anthers of which are 1-celled, dehiscing transversely across the apex. Another variation of structure, which has been long observed in a few species of the genus, would equally justify separation, as being of at least equal generic importance ; I allude to those in which the stamens of the male flower are united into four thick fleshy androphores, with a highly developed sterile pistil in the centre. Here then, (assuming that we are warranted in assigning generic value to such variations of structure, limited as they are to the male organization,) would be four distinct genera, and all, so far as such artificial characters can make them, equally stable.

I confess that I have an objection to this kind of excessive subdivision, inasmuch as whatever rule holds good with respect to Genera, must equally apply to Orders, and must inevitably lead to the elevation of half our present species to the rank of genera, and an equal proportion of genera to that of natural orders ; both of which might be avoided by a slight extension of our characters, and still better by a careful and com-

prehensive investigation of groups of allied species and genera, before attempting their disunion by the formation of new genera and orders. In support of these views, I think I may safely cite the recorded opinion of the first living authority, Mr Robert Brown. He says, in a letter to Dr Graham, referring to the plant which has called forth these remarks, "In your plant the structure of the anther is indeed very remarkable, and might well induce you to consider it a new genus; but it is right to add, that approaches to this conformation, and which serve to explain its analogy with the ordinary structure of the family, exist in *Garcinia*, with which I suppose your plant would agree in its female flower as well as in fruit." From this concluding caution I imagine that before establishing a genus on such grounds, he (Mr Brown) would have ascertained the configuration of the anther in the whole Order, marked its variations, and then, and not till then, have determined on the propriety or otherwise of assigning a generic importance to its variations: and I can scarcely avoid thinking, that, had such a course been followed in that instance, a sectional value only would have been awarded.

I admit that a less perfect examination of the Order *Guttiferæ* than that which improved materials have now enabled me to effect, led me into a similar error; on which occasion I proposed to subdivide the genus *Garcinia* into four distinct genera—*Garcinia*, *Mangostana*, *Cambogia*, and *Stalagmitis* (see *Madras Journal of Science*, vol. iv. page 304.) This suggestion has not, so far as I am aware, been yet adopted by any one; and I trust it will not; as I now consider it wrong in principle; the variations in structure, there pointed out, not meriting a higher than sectional value in a genus so strictly natural. Influenced by this reduced estimate of the relative importance of the several structural differences mentioned above, it is my intention, on the present occasion, to keep the old genus together; but divided into sections in accordance with them. I am induced to do so from observing that the variations are limited to the male

flowers, and do not on any occasion extend to the female. For example, *G. Mangostana* and *G. cornea* are referred to the same section; the former has a 4-8-celled ovary, and the latter usually 4 cells; in *G. Kydiana,* Roxburgh states the berry to have from 4 to 8 seeds; *G. Cowa* from 6 to 8; and most of the others are described as having 4, or 8 seeds; showing a general want of uniformity in this respect: variations, therefore, of the number of the cells of the ovary, cannot be admitted as of generic, or even specific value here. Should further acquaintance with the tribe prove that in uniting *Hebradendron* or rather *Cambogia*, Linn. (for they are the same genus, and the latter the more appropriate name) to *Garcinia*, I have erred, the error can be easily corrected; in the mean time, my sections will afford the means of more easily determining the known species, and of referring to convenient places such new ones as may be discovered. For the present, nothing is more difficult than to make out from description the species of *Garcinia.* This is mainly owing to the male flowers, which afford by far the best specific characters, being too little attended to in characterizing them. Generally speaking, they are diœcious, and, in collecting specimens, care should be taken to procure them of both sexes. The foliage, except in a very few instances, does not afford good discriminating characters, and when it does, is usually accompanied by others which are more to be relied upon."

My reasons for objecting to Dr Graham's new name, to the prejudice of Linnæus' old one, are thus briefly explained at page 125 under *Garcinia Cambogia* and *Roxburghii.*

"I have not quoted Linnæus' *Cambogia Gutta* for either of these plants, though it seems the general opinion of botanists that it belongs to the former:—this opinion, however, his brief description of the plant in the *Flora Zeylanica* shows to be erroneous, and proves almost to demonstration that it is Dr Graham's *Hebradendron.* The following are the words of Linnæus:—*Rami oppositi. Folia lanceolato-ovata, integerrima, petiolata, opposita. Flores verticillati sessiles.* It is in

truth the only plant of the genus in Ceylon, having sessile verticelled flowers. In his generic character he describes the anthers as *antheræ subrotundæ*, the pistil *germen subrotundum striatum, stylus nullus. Stigma quadrifidum persistens*,—and finally the pericarp—*Pomum subrotundum, octies sulcatum, octoloculare*,—showing clearly that the character of the flower and ovary is taken from one species, and of the fruit from a different one (or perhaps from Rheede's figure), owing to the imperfection of his specimens, and his not being aware that the lobes of the stigma afford a sure indication of the number of cells of the fruit. His *Cambogia*, however, if we disregard this error, is certainly the *Gamboge plant* of Ceylon, which is further established, as Dr Graham informs us, by the examination of the specimen in Herman's Herbarium, "which may be considered the type of Linnæus' *Cambogia Gutta*."—If, therefore, that plant is to be elevated to the rank of a genus, I should say his name ought unquestionably to be retained with an amended character, and botany relieved from the unseemly allusion conveyed under the new one. If Murray's *Stalagmitis* is on account of priority to supplant Roxburgh's *Xanthochymus*, much more must Linnæus' *Cambogia* supplant Graham's *Hebradendron;* partly for the same reason, priority, but principally, because Dr Graham knew when he gave the name that his plant was identical with that of Linnæus; while it is almost impossible that Roxburgh could ever recognise his *Xanthochymus* in Murray's character of *Stalagmitis*, made up as it is from two genera (*Garcinia* and *Xanthochymus*) so distinct as not to be referrible even to the same Natural Order. In my opinion, *Stalagmitis* ought to be suppressed, and *Xanthochymus* retained."

The allusion to *Stalagmitis* in this passage refers to the following sentence, which I quote from Dr Graham's paper. "It appears then that the generic name of *Xanthochymus* must be dropped, and that the species which belonged to this genus must (for the future) receive the appellation of *Stalagmitis*." This reasoning seems to have carried conviction to Dr Lindley's mind, for he has acted upon it so far as to

append in his *Flora Medica* the name *Stalagmitis* to our (Wight and Arnott's) character of *Xanthochymus*, as being the original and legitimate name of the genus; but, apparently without due consideration; because, forgetting the rights of priority in the case of *Cambogia Gutta* of Linnæus, he has followed Graham in quoting that name, without any doubt as to the identity of the plants, as a synonym for the very modern *Hebradendron Cambogioides* of Graham. Upon what grounds this degree of favour is to be shown to *Hebradendron*, and withheld from *Xanthochymus*, I am quite unable to discover or even to conjecture: that Dr Graham should have inadvertently committed such an oversight is not so much to be wondered at, writing as he did under the excitement of having discovered the long sought *Gamboge plant;* but that Dr Lindley should have implicitly followed him is to me surprising.

In my own and in the name of all working botanists, who are daily called upon to unravel the mazes of involved and perplexed generic appellations, I enter my protest against any unnecessary changes in a science already overburthened with them, and one too which must in its very nature become more and more so every day. To have assigned the name of *Hebradendron Cambogioides* to the very plant which Linnæus called *Cambogia Gutta*, and then to quote the original name as a synonym of the new one, without doubt or question as to the identity of the plants, I hold to be such an unnecessary change, and therefore consider it a duty to express my sentiments regarding it; the more so, as I do not deem the genus itself a tenable one. To its validity, or the reverse, however, I should not have thought it necessary thus to advert, if the old name had been retained; what I object to is the inconsistency of setting up an inadequately defined genus without a single genuine species to support it, for such I maintain *Stalagmitis* to be, and putting down a supposed good one, resting on the very same foundation on which its successor is raised, the same species being the basis of both. In the case of *Stalagmitis*, I demur to the course pursued, on the ground

of its being *ab origine* a spurious genus, constituted partly from notes taken from one species, the flowers of which, Murray, the author of the genus, never saw, and partly from flowers of another which he examined; and from such heterogeneous materials, with what ingenuity he was master of, he invented a generic character not adapted to either. That every thing might be in just keeping in this curious medley, it now appears that he had for his only species a specimen made up of the fragments of two plants, no more fit to represent either correctly than his character could amalgamate the peculiarities of both, they being referrible to two distinct Natural Orders. With all this information before him, and hunted out with much labour by Dr Brown and himself, Dr Graham tells us that the generic name of *Xanthochymus* must cease and that of *Stalagmitis* be substituted for it; or, in other words, that we must put down a good genus and set up a nonentity, a genus without a species. That one of the two must be abolished is certain; but I hope botanists will show more consideration for the meritorious and diligent labours of Roxburgh, than to displace his really well-defined generic name, in favour of one which nobody could understand, or apply from its own terms; and which, now that its inconsistencies have been brought to light, no one could adopt. As I have examined this question somewhat in detail, in a postscript to my article on the *Guttiferæ*, I shall subjoin it also, for the benefit of those who may not have an opportunity of consulting the original work; in the hope that by thus calling attention to the subject, my remarks may have the effect of causing botanical authors to pause ere they sanction by adopting them, such uncalled-for, and, I fear, if not opposed in time, likely to become prejudicial innovations. I now take leave of the subject, and sincerely hope I may not again have to revert to it.

P.S.—After this article was completed, and the greater part of it printed, I received Lindley's "*Flora Medica*," a

new work just issued from the press, and, like all the other works of the accomplished author, forming a most valuable contribution to botanical science, on the present occasion in connexion with medicine. In this work I find Dr Lindley has added the weight of his authority to that of those who adopt Murray's *Stalagmitis* in preference to Roxburgh's *Xanthochymus*. This he does for the reasons adduced by Dr Graham; namely, that Mr Brown had examined Murray's specimen and ascertained that it consists of two plants, probably of two genera, one of which, in flower, is a *Xanthochymus*, the other, not in flower, supposed to be Graham's *Hebradendron*. Having expressed my belief that *Xanthochymus* does not belong to this Natural Order, and having no new species to add, nor other information to communicate respecting it, I did not intend to have noticed that genus in this place. But having said above, that in my opinion, *Stalagmitis* ought to be suppressed, and *Xanthochymus* established in its room, I feel now called upon to state more fully my reasons for thinking so, and shall commence by extracting from the "*Companion to the Botanical Magazine*," the passage of Mr Brown's letter, quoted by Dr Graham as his authority for saying that the generic name *Xanthochymus* must give place to that of *Stalagmitis*. "The plant sent pasted by König to Sir Joseph Banks, as one specimen, I have ascertained to be made up of two plants, and very probably of two genera. The union was concealed by sealing-wax. The portion in flower, and which agrees in structure with Murray's account, is, I have no doubt, the *Xanthochymus ovalifolius* of Roxburgh; *Stalagmitis* and *Xanthochymus* are therefore one genus, as Cambessédes has already observed, giving the preference to the earlier name of Murray; this flowering portion, however, forms but a small part of the whole specimen, the larger portion being, I am inclined to think, the same with your plant, of which I have seen, and I believe still possess, the specimen you sent to Don.* The structure, how-

* One of those received from Mrs Walker.

ever, of this greater portion cannot be ascertained from the few very young flower-buds belonging to it. It approaches also very closely, in its leaves especially, to that specimen in Hermann's herbarium which may be considered as the type of Linnæus' *Cambogia Gutta.* A loose fruit, pasted on the sheet with König's plant, probably belongs to the larger portion, and resembles Gærtner's *Morella.*"

So far all appears clearly in favour of *Stalagmitis*, and had Murray in drawing up his character rigidly confined himself to the description of the flowers before him, I should at once have adopted his name in preference to Roxburgh's. But on turning to his character, as given in Schreber's *Genera Plantarum*, we find a 4-leaved calyx, a 4-petaled corolla, and a 4-lobed stigma, combined with pentadelphous stamens, 3-seeded berries, the stigmas sometimes trifid, stamens not always polyadelphous? &c. From this very unusual combination of quinary and quaternary forms, I am led to infer that the character is only partly derived from the specimen, and partly, if not principally from notes communicated by König, who, it appears, from the fact of his having combined, on the supposition that they were the same plant, two distinct species, was not aware of the difference, and misled Murray by transmitting written characters of a *Garcinia*, and flowers of another plant; so that, between the two, there has resulted a set of characters not likely to be often found combined in the same species, and still less frequently in one small specimen. Roxburgh, on the other hand, briefly and clearly defines a genus of plants well known to him, and extensively distributed over India, about which he has scarcely left room for a mistake. If further proof be wanted in support of the opinion I have advanced that this is a hybrid genus, I adduce Cambessédes, whose authority is quoted for the identity of *Stalagmitis* and *Xanthochymus*. He has strictly followed Murray, adopted all the contradictions of his character, and constituted a genus imbodying, first, Roxburgh's genus *Xanthochymus;* next, Petit Thouars' *Brindonia*, evidently identical with *Garcinia;* then Loureiro's *Oxycarpus*, also *Garcinia;* and lastly, (if I

am not misled by Mr George Don, whom I am obliged for want of Cambessédes' own memoir to follow) nearly the whole of Roxburgh's species of *Garcinia;* as if Roxburgh was not able, with growing plants before him, to discriminate between two genera so very distinct as *Garcinia* and his own *Xanthochymus.* In a paper published in the *Madras Journal of Science* for October 1836, I showed, from the internal evidence afforded by the two sets of characters, that Murray's *Stalagmitis* and Roxburgh's *Xanthochymus* were almost identical, and attributed the discrepancies to the defects of Murray's solitary specimen; a view which Mr Brown has shown to be only partly right, by proving that they in some measure originated in the imperfect observation of König, who supplied Murray with the materials for his genus.

Having now adduced what I esteem conclusive evidence in support of the opinion I advanced above, that Murray's genus is spurious, and that of Cambessédes, founded on it, is most unnatural, as it associates species that never can combine generically; while Roxburgh's is a strictly natural genus, including several nearly allied species, and, moreover, probably belonging to a Natural Order, different from more than half the species referred to it under the name of *Stalagmitis* by Cambessédes; I consider myself fully justified in continuing to adopt the generic name *Xanthochymus* (even though opposed by the highest botanical authorities), until careful examination of the original specimen, with reference to the elucidation of the discrepancies I have indicated, shall have proved that such actually exist in *that* specimen. If they do exist, then the fault is not Murray's, and his name must of right be adopted with an amended character, excluding the numerous species of *Garcinia* brought under it by Cambessédes: if they do not, Roxburgh's genus, which as it now stands is strictly natural, claims the preference.

On the Laurus Cassia of Linnæus, and the plants producing the Cassia Bark of Commerce.

The next point on which I have some remarks to offer is the *Laurus Cassia* of Linnæus, and the plants producing the *Cassia Lignea* or *Cassia Bark* of commerce. My attention was first directed to this subject by a communication from Government, in which I am requested to endeavour to ascertain "whether the common Cassia bark of the markets is a thicker and coarser portion of the bark of the genuine *Cinnamon plant* or *tree*, or whether it is the bark of a plant not analogous to the *Cinnamon plant* or *tree*."

Before it was possible to return a satisfactory answer to this question, it seemed incumbent on me to ascertain what plant Linnæus meant to designate under the appellation of *Laurus Cassia*, and whether it was probable the plant so called could supply all the bark passing under the name in the markets of the world. This primary, but most difficult inquiry was rendered indispensable by the, generally supposed ridiculous, assertion of Mr Marshall, that the leaves, and the bark of the trunk and branches of the *Laurus Cassia* of Linnæus, so far from being aromatic and spicy like cinnamon, are bitter and have in a slight degree the taste and odour of myrrh. This assertion, wide as it may appear of the truth, is yet founded in fact, and what may appear still more extraordinary, it has elicited a discovery, which, without such aid as he has given would not probably have soon been made by a professed botanist, a title to which I believe Mr Marshall does not aspire. He appears to have been led, simply through the native name, to the inference that the *Laurus Cassia* of Linnæus does not produce aromatic bark, and wonders how it could have received from him the name of *Cassia*, and have qualities attributed to its bark which it does not in the slightest degree possess. I think I can now answer the question, and explain the mystery which has so long hung over this species, and been hitherto rendered only more obscure by each attempt to bring it to light.

It is well known to modern botanists that many of their

earlier predecessors were but indifferent describers of plants and often very loose in their quotations of figures as synonyms, an error into which Linnæus fell about as often as any of his contemporaries. He seems to have had an idea that delineations were generally at best but approximations to the truth, so that if a figure exhibited even a remote similarity to a plant before him, especially if from the same country, he might with safety quote it as a synonym. Bearing this in mind, we can easily account for a number of errors to which his incorrect synonyms have given rise. The present instance affords an excellent example of what I have here stated, and one which, but for the discovery of Mr Marshall, might have long remained undetected.

In Herman's herbarium of Ceylon plants, he (Linnæus) found one bearing the native names of "Dawalkurundu, Nikadawala," under which it is referred to, or described in Herman's *Musæum Zeylanicum*. This he considered a species of *Laurus*, apparently from habit alone, and in his usual brief precise style calls it, "Laurus foliis lanceolatis trinerviis nervis supra basin unitis;" having previously described the true *Cinnamon*, as "Laurus foliis ovato-oblongis trinerviis basi nervos unientibus." The difference between the two, as indicated by the names, seems very slight, merely depending on the one having lanceolate leaves with the nerves united above the base; while in the other the leaves are said to be ovato-oblong with the nerves distinct to the base—discrepancies small indeed, and such as could never be of much avail in distinguishing the one plant from the other, since they are both constantly met with in different leaves on the same tree. Such being the case, it is not much to be wondered at that botanists should have been surprised by the boldness of Mr Marshall's announcement, that two trees, believed to be of the same genus, and so nearly alike in their external forms, should yet differ so very widely in their properties. But so it is, and nothing can be more certain than that the fact is as he states it.

In proceeding to trace the history of the two species, aided

by the light Mr Marshall has thrown on them, our difficulties vanish like mist before the noonday sun, though Mr M. himself has found it "difficult to conceive how the Dawalkurundu obtained the appellation of *Laurus Cassia* from Linnæus." It was because Linnæus' specimen of *Dawalkurundu* was neither in flower nor in fruit. Had it been so, he was too acute an observer ever to have confounded it with the plants with which he has associated it in his synonyms. This explanation, it may be answered, is mere assumption on my part—it certainly is so, but supported by such strong circumstantial evidence, as not to leave a doubt of its correctness. Linnæus has in his *Flora Zeylanica* given a short description of each of these species: his description of the *Cinnamon* is principally confined to the flower, and is most precise. In his description of the other, the flower is not once alluded to. Here he declares, that he knows not by what mark to distinguish it from the *Camphorifera japonensium*, which in its foliage it greatly resembles, while nothing can be more distinct than its inflorescence—that of the *Camphor-tree* being a panicle, having a stalk as long as the leaves, while in *Dawalkurundu* it may be described as a subsessile capitulum, that is, 5 or 6 sessile flowers congested on the apex of a very short peduncle, and surrounded by an involucrum of 4 or 5 leaves; several of which capitula usually form verticels round the naked parts of the branches where the leaves have fallen. He begins his description of *Laurus Cassia** by stating that he at first considered it a variety of the antecedent (Cinnamon,) but now that he knows not by what mark to distinguish it from *Camphorifera japonensium*, for the leaves are thinner than those of *Cinnamon*, their nerves uniting above the base as in *Camphorifera*, and are sprinkled beneath with a greyish dew (*subtus rore cæsio illinita*) as in the *Camphor-tree*, and are at

* "Hanc speciem olim pro antecedentis varietate habui, nunc vero, qua nota hanc a *Camphorifera japonensium* distinguam, non novi; Folia enim Cinnamomo tenuiora, nervis ante basin coeuntibus ut in Camphorifera; subtus rore cæsio illinita, ut Camphora, et simul lanceolata ac tenuiori substantia quam præcedentis."—*Linn. Flor. Zeylanica, p.* 62.

the same time lanceolate and of a thinner texture than the preceding (Cinnamon). The whole of his definition, in short, agrees most exactly with Mr Marshall's description of the Cingalese *Dawalkurundu*, and leaves not a doubt that both had the same plant in view, and consequently that Mr Marshall is so far correct in saying that the bark of the *Laurus Cassia* of Linnæus possessed none of the qualities attributed to it. Hitherto all is clear, but now the chapter of errors begins.

Had Linnæus been permitted to exercise his own unbiassed judgment in this case, it is not improbable he would have avoided the mistake of assigning to a plant which, with all his acuteness, he knew not how to distinguish from the *Camphor-tree*, the credit of producing *Cassia;* or at all events would not have done so without some expression of doubt, so as still to leave the question an open one. But, upon consulting other authorities, he found in Burman's *Thesaurus Zeylanicus* the figure of a species of *Cinnamomum* or *Laurus*, as he called the genus, to which Burman had given the name of *Cinnamomum perpetuo florens, &c.*, and assigned to it the native name of *Dawalkurundu*, not as it appears from the specimen itself having been so named, but because, being different from the true Cinnamon of which he had seen specimens and figures, he thought it an inferior, wild or jungle sort, and that it must of necessity be the plant which Herman has described in his *Musæum Zeylanicum*, though the inflorescence differed much from the description, (a very essential point, which Burman remarked and endeavours to explain away,) and therefore gave it the same Cingalese appellation. Linnæus' specimen not being in flower, and the resemblance between the specimen and figure being in other respects considerable, he had not the means of detecting the discrepancy, and unsuspectingly adopted Burman's figure and name as a synonym to his plant. In Rheede's *Hortus Malabaricus* (1. tab. 57) he found the figure of another cinnamon, even more closely resembling his plant in its general aspect than Burman's figure, this he also associated as a synonym; and Rheede's plant being lauded

on account of the aromatic properties of its bark and leaves, which resemble the true cinnamon, though it is not the genuine cinnamon-tree, he seems to have considered himself quite safe in associating this also, and, therefore, called the three species, this *tria-juncta-in-uno* plant, *Laurus Cassia*, and assigned it as the source of the officinal "*Cassia Lignea cortex.*"

After this exposition of the origin of the species *Laurus Cassia*, it can scarcely be a matter of surprise that no two botanists have ever agreed as to the plant which ought to bear that name; nor, that none should ever have surmised what plant Linnæus had constituted the type of his species. It is far from my intention on the present occasion to extend these remarks, by tracing the various conjectures that have been promulgated on the subject; suffice it to say that no one, so far as I am aware, has taken a similar view as that now set forth. It only further remains for me to give some account of the three species thus erroneously associated.

The first mentioned, *Dawalkurundu*, (Linnæus' own plant and the type of the species,) is, I believe, the *Laurus involucrata* of Vahl and of Lamarck in the *Encyclopédie Méthodique*, and has, in Professor Nees' *Monograph of the Indian Laurinæ* (Wall. Plant. Asiat. rariores,) received the name of *Tetradenia Zeylanica*, but is the *Litsea Zeylanica* of a former work of his, a name which I presume must be restored, owing to the other being preoccupied. The slight difference of structure does not seem to render a new genus necessary.

The second and third have both been referred, by the same eminent botanist, to his variety of the true cinnamon, the *Cinnamomum Zeylanicum*; a decision to which I cannot subscribe, as I do not perceive that either of these figures are referrible to any form of that species, and they besides differ specifically from each other.

The *Cinnamomum perpetuo florens* appears to me a perfectly distinct species, very nearly allied to, if not actually identical with, Nees' own species *C. sulphuratum*, of which I now have specimens from Ceylon. This I infer from the appearance

of the plant as represented in the figure; for, if any dependence is to be placed on the description, it is impossible to admit it into the genus. On this, however, we cannot place much reliance, as it was not the practice a century ago, when a description was written, to examine the structure of flowers with the same care that is now bestowed. Should it be objected that the species I quote as the *C. perpetuo florens* is clothed with yellowish pubescence, which is not mentioned by Burman, then I possess another from the same country (Ceylon), perfectly glabrous, and agreeing in the form of its leaves, but differing in having more numerous and smaller flowers, which may be substituted; and which I do not consider, any more than the other, as a variety of the genuine cinnamon-tree.

The Malabar plant *Carua* (Hort. Mal. I. tab. 57), on the other hand, I should pronounce to be a very passable figure of a plant in my herbarium, named by Nees himself, *Cinnamomum iners;* but, whether or not I am right in the species to which I have referred it, I feel no hesitation in giving it as my opinion that it is not referrible to any form of the *C. Zeylanicum.* Neither can I agree with him in believing the plant figured under the name of *Laurus Cassia* in the *Botanical Magazine*, No. 1636, is referrible to the Ceylon species, but is I think very like the Malabar one, the only species of the genus to which the name *Cassia* should be applied, if that name is still to be retained in botanical nomenclature, as being the only one of the three associated species known to produce that drug. Another plate of the *Botanical Magazine,* (*Laurus Cinnamomum*, No. 2028,) I also refer here, and feel greatly at a loss to account for its introduction into that work under a different name from the preceding. The plant which Nees formerly considered the *Laurus Cassia*, but now calls *Cinnamomum aromaticum*, from China, is a closely allied species, but is distinct, and furnishes much of the bark sold in the European markets under the name of Cassia; though it has nothing whatever to do with the *Laurus Cassia* of Linnæus, which, from the preceding history appears strictly

confined to Ceylon and India proper; and that name, not being referrible to any one species, ought unquestionably to be expunged from botanical nomenclature, its longer continuance there only tending to create confusion and uncertainty. This brings me to the next question—namely, what plant or plants yield the Cassia bark of commerce?

The foregoing explanation, in the course of which two plants are referred to as yielding Cassia, greatly simplifies the answer to this one. The first of these is the Malabar *Carua* figured by Rheede, the second Nees' *Cinnamomum aromaticum.* The list, however, of Cassia-producing plants is not limited to these two, but I firmly believe extends to nearly every species of the genus. A set of specimens, submitted for my examination, of the trees furnishing Cassia on the Malabar Coast, presented no fewer than four distinct species; including among them the *genuine Cinnamon plant*, the bark of the older branches of which, it would appear, is exported from that coast as Cassia. Three or four more species are natives of Ceylon, exclusive of the *Cinnamon proper*, all of which greatly resemble the Cinnamon plant, and in the woods might easily be mistaken for it, and peeled, though the quality would be inferior. Thus we have from Western India and Ceylon alone, probably not less than six plants affording Cassia; add to these nearly twice as many more species of *Cinnamomum*, the produce of the more eastern states of Asia and the Islands of the Eastern Archipelago, all remarkable for their striking family likeness, all I believe endowed with aromatic properties, and probably the greater part if not the whole contributing something towards the general result; and we at once see the impossibility of awarding to any one individual species the credit of being the source whence the *Cassia Lignea* of commerce is derived; and equally the impropriety of applying to any one of them the comprehensive specific appellation of Cassia, since all sorts of Cinnamon-like plants, yielding bark of a quality unfit to bear the designation of Cinnamon in the market, are passed off as Cassia.

XIX.—BOTANICAL INFORMATION.

(At page 187 of this Journal, our readers will see that mention has been made of Mr James Drummond, formerly of the Cork Botanic Garden, brother of the late Mr Thomas Drummond, and now residing at Swan River Colony, Australia, whence he has sent home highly interesting collections of the plants growing in the vicinity of the town of Freemantle. The same observing and meritorious Naturalist transmits the following account of two excursions that he made there last year, (1839,) together with observations on the vegetation that prevails in that far distant settlement. Remarks such as these on the plants of newly founded colonies, are the more valuable, because the progress of cultivation and the importation of foreign species have a well-known tendency to extirpate the native products of the soil; witness St Helena, where arborescent *Syngenesiæ* and *Tree-Ferns* only linger on the summits of the mountains, having yielded their places to the Scotch Fir and other European trees. Mr Drummond's observations show, that near the Swan River, a similar change is in progress, in which perhaps our readers will be ready to trace an analogy to the more momentous consequences of civilization, as regards the animal as well as the vegetable creation.)

Town of Freemantle,
Swan River Colony, *June*, 1839.

The sea-coast in the neighbourhood of Freemantle, is a low range of secondary limestone hills; the limestone is rather a curious variety, having a good deal the appearance of petrified trees, with hollows in the rocks where the trunks of the trees had formerly stood. There is little soil on these hills, but they are thickly covered with shrubs of various sorts; a beautiful holly-leaved *Chorizema*, with red flowers, grows near the signal-post on Arthur's head; a red-blossomed *Grevillea*, in foliage and habit resembling Southern-wood, and a pale rose-coloured species with trifid leaves and rough capsules, are found on the same hill; a lilac-flowered *Petrophila* with multifid leaves, and a beautiful *Leschenaultia** with the lower part of its flower golden-yellow, and the upper part iron-red, adorn the road-side between Freemantle and the Cantonment. Among the rocks by the water-side over the

* Probably *L. laricina*, or *L. glauca*, of Lindley, in *Botany of the Swan River Settlement*, p. 27.

latter spot, the *Hibiscus Hugelii* is seen, and a beautiful oak-leaved *Lasiopetalum*, with large lilac inflorescence; a dwarfish arborescent species of *Dryandra*, with white flowers and small holly-like leaves, is common among the limestone rocks, as far as Mount Eliza. *Banksia Menziesii* and *Frazeri*, are the individuals of this genus which grow nearest the coast; the *B. Menziesii* is a beautiful shrub, its flowers varying from a deep iron-red in every shade to pale yellow. Half way between Freemantle and Perth, our *Mahogany* and *Red Gum* make their appearance; these are two of the finest species of *Eucalyptus*. Frazer describes our *Red Gum* as a gigantic *Angophora*, from which I judge the species is not known at Sydney; it has more the habit of the *English Oak* than any of our forest-trees. The *Mahogany* is a valuable timber for house or ship building; the serpentine varieties, thus named from the undulating form assumed by the vessels of the wood, are very curious, and so far as I have observed only found in the Genus *Eucalyptus*. One large *Banksia*, the native *Mangite*, grows with the *Red Gum* and *Mahogany;* it passes for the *B. grandis* of *Linnæus*, but does not answer well to the description. The lips of the follicles, which Brown describes as smooth in *B. grandis*, in our plant are always covered with rusty down, the leaves in luxuriant specimens are two feet long and two inches broad, the spikes of flowers from fourteen to sixteen inches: the natives, men, women, and children, live for five or six weeks principally upon the honey which they suck from the flowers of this fine tree. One of the most striking plants to a stranger is our common *Blackboy*,* a fine arborescent species of *Xanthorrhæa*, growing from ten to fifteen feet high, with a trunk about a foot in diameter, and a flower-stalk almost as high as the plant itself; the common kind is sometimes repeatedly branched in a dichotomous manner, all the branches of equal thickness. The spot where the town of Freemantle now stands was originally a

* The common Scotch appellation of the *Black-berry* or *Bramble-berry*.

grove of this *Xanthorrhæa*, called here *Blackboys*, but which now get scarce in the neighbourhood of the settlements from the numbers used as firewood. The Genus is of very slow growth, the largest specimens must be several hundred years old; these furnish the natives with a favourite article of food in the *larvæ* of a large brown species of *Cerambyx*, and also afford a good substitute for lucifer-matches. When the indigenous tribes happen to be without fire in the bush, they select an old but sound flower-stalk of *Xanthorrhæa*, with the dry flowers and seed-vessels remaining: of these they make a small heap on the ground; then break off about a foot or eighteen inches of the upper part of the flower-stalk, and split the remaining part in the middle, placing one half with the split side up, over the little heap of withered flowers; this done, they apply the small end of the broken off part to the middle of the split portion holding it upright between the palms of their hands and rolling it backwards and forwards with rapidity. Thus a small hollow is soon formed in the split stalk like the half of a bullet-caster, when they make a small orifice on one side for the fire to escape into the dried flowers, where it spreads as in tinder, the whole process not occupying three minutes even in wet weather. In very wet weather, they are, however, sometimes obliged to substitute the pounded *leaves* of the *blackboy*, which are always found dry under large plants, instead of the old *flowers*. It is a curious fact, that these two most striking *Genera* on the mainland are both wanting on Garden Island.

The secondary limestone formation on the right bank of the Swan river, terminates at Mount Eliza near Perth; it appears again on the left bank opposite the Peninsula Farm, and continues in a narrow ridge, with few interruptions, to Guildford. Concretions of shells with square valves occur under the limestone at Redcliff, and at Preston Point and other places, and petrified shells nearly resembling those that are found recent. The *Nuytsia*,* the most magnificent of our

* *N. floribunda*, (*R. Br.*) and of Lindley, *Swan River Botany*, *p.* 39. *t.* 4.

forest-trees, grows plentifully between Freemantle and the foot of the Darling range of hills; when in blossom it appears at a distance like a fire in the woods. On approaching it, the noise from the numerous *Coleopterous*, *Dipterous* and *Hymenopterous* insects which feed upon the flowers, resembles the sound of several bee-hives. A large white *butterfly*, with red spots on the wings, is seen in great numbers hovering over the tree, this species, I think, belongs to the *P. Brassicæ* family, the *larvæ* of it feed in numbers together on the *Eucalyptus* and *Melaleuca;* there are other species of *Papilio* also about the tree, and the honey-sucking and insect-eating birds are all on the alert. The trunk of the *Nuytsia* is from two to four feet in diameter; its leaves are like those of *Taxus elongata*, and the seeds resemble Rhubarb; they vegetate with several cotyledons like the pine. One of the commonest trees about Perth recalls to the mind of the settlers an English Holly, its small clusters of flowers, followed usually by a single seed-vessel, have a similarity to *Hakea*, but the form of the seed proves it to be a *Banksia*, at least it comes nearer Mr Brown's *B. ilicifolia* than any other described species. Mr Brown's *ilicifolia*, if I mistake not, is a small upright-growing species plentiful about Albany and King George's Sound. The plant found here is from eighteen inches to two feet in diameter, the flowers are yellow when they first come out and change to a deep red, the species is almost always in flower. Mr Brown describes his plant as bringing about five seeds to maturity; ours generally ripens but one, and I have never seen more than three. Some fine *Leguminous* plants grow about Perth; our common climber is a lovely blue *Kennedya*, admired by every body; a beautiful *Hovea*, its narrow leaves terminating in sharp thorns, grows near Mr Andrew's of Villa Grant; and a fine lilac-flowered plant from ten to fifteen feet high, by the stream of water as we enter the peninsula, the shape of its seed-vessel resembling that of *Astragalus:* I have met with three species. About two miles to the east of the Pine Apple Inn, on the road to the head of the Swan River, a beautiful yellow flower

is seen, which I sent to London some years ago, and was informed that it constitutes a new Genus* belonging to the *Natural Order Chamælaucieæ*, of *De Candolle*. I have gathered nine or ten species of the same Genus, most of them very beautiful. On the bank of the river, a few hundred yards above Mr Hardy's house on the Peninsula Farm, a species of *Xylomela* grows, I suppose *occidentale* of Frazer. It is curious to observe the numbers of foreign plants that have established themselves on the Peninsula farm and about all the old settlements; affording a clear proof that man, when he emigrates, carries the weeds that are most troublesome in cultivated ground along with him. Here the *Lolium temulentum* and several species of *Wild Oats* have taken exclusive possession of the lands first broken up for wheat; the elegant *Briza minor* and the *Phalaris aquatica* are two of the commonest grasses on the farm; the *Centaurea solstitialis* is one of our chief pests; *Polygonum aviculare* is also very common, but it is much relished by cattle. There are several foreign plants that become troublesome weeds here, which are not known (at least as weeds) in England. I myself introduced the first *Cape Gooseberry* (*Physalis Peruviana*), and the first *Solanum Capense*, and in the short space of ten years they are perfectly naturalized; the *Solanum lunatum* we found on Garden Island when we arrived, but it has since made its way to the mainland, and is plentiful about Perth. The English *Sowthistle* (*Sonchus oleraceus*) which now is the most annoying weed we have all over the country, even so far as the York district, was quite unknown when we came here; the native *Sowthistle*, a far finer plant, growing eight or ten feet high, being at this time almost extinct about the settlements. The species of *Casuarina* called *Swamp Oak* by the settlers, produces on the Peninsula two kinds of *Loranthus*, one bearing hoary and the other green awl-shaped leaves. It is a curious fact that these parasites generally have some similarity to the trees on which they grow. Those

* *Chrysorrhöe*, of Lindley.

Loranthi inhabiting the *Casuarina*, and much resembling the branches of that plant, are thus easily overlooked; while the species found on the *Gum-trees*, a fine red-flowering one with large lanceolate leaves, is generally passed over as a diseased branch of the *Gum-tree*, the leaves of the *Loranthus* being naturally of a yellowish-green colour. On the Peninsula Farm, the *Xanthorrhœa*, called by the settlers the *under-ground blackboy*, first makes its appearance. It resembles when growing a large tuft of yellow *Asphodel*, and bears several flower-stalks eight or ten feet high: it is difficult to clear the land intended for wheat or other crops of this plant, and a pity it is that it should be destroyed, experience proving it to be one of our most valuable sorts of food for stock of all kinds; in the very dry weather, when the grass is burned up or destroyed by bush-fires, sheep and cattle of every description living principally on the tops of the different sorts of *Xanthorrhœa*.

From the Swan River, opposite the Peninsula Farm, to the foot of the Darling range of hills, a distance of about ten miles, is an undulating country, the surface principally of siliceous sand, in some places producing what we here denominate *Mahogany*, in others what the settlers call *stunted Banksia*, that is B. *Menziesii* and *Frazerii*. The fine *Anigozanthus latifolia* of *Frazer*, our large green and crimson species, is common all the way from Freemantle; but the green swamp *Anigozanthus** and the dwarf orange, both beautiful, are principally confined to the south of the Swan River. Of the pretty genus *Thysanotus*, called *Fringe-flower* or lace-plant by us, I have gathered about twenty species between the Swan and the top of the first range of hills. Of *Patersonia*, a fine genus belonging to *Irideæ*, I have detected ten species; one of these, a fine yellow-flowered plant, grows on the top of the Darling range, about half-way between the Helena and the Canning rivers; the beautiful *Pimelea*† with crimson bracteas of which I send home specimens, is found at the same place.

As we approach the foot of the hill, the country becomes

* *A. humilis*, Lindl. l. c. t. 6. B. † *P. spectabilis ?* Lindl. l. c. p. 41.

more open, and here the first *Kingias* make their appearance; they have the habit and appearance of the *black-boy*, growing from twenty to thirty feet high, there are from fifteen to twenty flower-stalks on the same plant, each nearly eighteen inches long; the flowers are borne in round heads, about two inches in diameter. With the *Kingia*, a pretty dwarf species of *Banksia* occurs; the buds are oval, but the full-blown flowers and seed-vessels are round, the former are orange-coloured, inclining to yellow, the seed-vessels are covered with a rusty down, which distinguishes it from another round-headed kind found nearer the foot of the hills. In proceeding straight from the Peninsula towards *Wallup*, the native name of a remarkable hill which lies about a mile to the west of the gorge of the Helena river, where it makes its way through the Darling range of hills, by what the settlers call the *Rocky pass*, we come to what are called the Guildford lakes, where some curious plants grow, particularly the two species of *Melaleuca*, which the settlers term *Tea-tree*, and the natives *Yumback;* one of the species, seen only by fresh water, attains a diameter of six feet; the other, which is observed sometimes in salt-marshes, grows about two feet—both kinds have their bark composed of numerous layers of cuticle, something like that of the *Birch*. Of this bark, the natives construct their houses, whenever they can procure it convenient to where they bivouac, which they generally do near water. With the flower-stalks of the *black-boy* and the bark of the *Yumback*, they in a few minutes build a house perfectly impervious to rain, and, with a fire in front, can regulate the heat to any degree they think proper. Several of first settlers' dwellings were covered with this bark; I think some of them still remain, at least they did so very lately.

In the Guildford lakes, a beautiful aquatic *Orchis* prevails, flowering in the greatest perfection where the water is about nine inches in depth; its blossoms are large, of a light blue colour, finely marked, and the inner divisions of the perianth spotted with deeper shades of the same colour. In this *Orchis*, the lower lip becomes contracted in the middle, and bears what I

suppose to be the stigma, it afterwards expands so as to resemble one of the divisions of the perianth. The low sand-hills, a little to the south of the Guildford lakes, produce a charming plant, resembling an *Anigozanthus*, but having a regular corolla; the colour of the flower is a deep orange, inclining to red. As we approach the base of the hills, the species I call the celestial blue *Leschenaultia*, a most delightful plant, makes its appearance; while the crimson *Hakea*, another elegant native production, in some places gives a ruddy colour to the very hills when it is in blossom. In an open spot, within about a mile of the foot of *Wallup*, a beautiful *Dryandra*, with large glaucous and curiously-spiral leaves, grows, its flowers and seed-vessels are produced close to the ground, the latter partly buried under it, as they are in *D. bipinnata* of Frazer. On the same spot as affords the spiral-leaved *Dryandra*, grows a glaucous-leaved round-headed *Banksia;* this species creeps at the root for several yards, its flowers are yellow, some of them inclining to brown. I send you specimens of these round-headed sorts, I do not know if they are both described by Mr Brown. Nearest the hills, we meet with a plant which is very striking from the white plumose nature of its footstalks, for the flowers are of a black colour, and so small as to be scarcely perceptible; the seeds resemble *Conospermum*, but it seems to form a natural genus sufficiently characterized by its white feathery footstalks and small black inflorescence. I have gathered five or six species, distinguished by the form of their leaves. A beautiful star-flowered hexandrous, sometimes octandrous plant, is very common about the foot of the hills, the seed is cone-shaped, crowned with the star-like corolla as in *Callitrix*. Of that pretty genus, nine or ten species occur between the Swan River and the top of the hills, (first range.) Of *Stylidium* I have gathered thirty different kinds in the same extent, and of terrestrial *Orchideæ* thirty species. Mr Brown, I think, remarks that there are few yellow-flowered *Stylidia;* but ten species of that genus found here, bear yellow flowers; one species which grows on *Wallup*, having fine yellow

flowers variegated with red, and white flowers marked with red growing on the plant at the same time. I cannot tell whether the yellow or white flowers are mutable, they remain so on the specimen when it is dry. We have two very curious genera of *Orchideæ*, one I call the *Fly-catching*,* and the other the *Hinged Orchis*. Of the fly-catching there is but one species; it is very small, with a single lanceolate leaf, the flower-stalk growing about three inches high, the lower part of the flower forms a boat-shaped box, and the upper part a lid which exactly fits it. When the flower expands, the lid rises up and turns back, so that it (the inside of the lid) becomes the highest part of the flower; the inside of this lid resembles an insect, and seems in some way to attract insects, for the minute one alights on it, it acts like the stigma in *Stylidium*, turning fairly round, and enclosing the insect in the lower part of the flower as in a box. In this *Orchis* the anthers are placed in the lower part of the flower, and the upper part (the lid), which I think must be the stigma, has to pass and repass them as the flower opens and shuts; when touched with any thing the lid instantly closes, but soon opens again if it catches nothing; when it captures an insect, it remains shut longer than I have continued to watch it. The *Hinged Orchis*† of which I have found three species, are scarcely less curious in their economy. The divisions of the perianth in this genus are five in number, they are narrow and apparently only useful to protect the upper lip and the hinged part, which in this genus is the lower part of the flower; four of the divisions of the perianth, as soon as the flower expands, fall down by the side of the germen, one continuing to stand up behind the upper lip. You will perceive in the specimens I send you, the remarkable hinge in the middle of the insect-like part; when the wind or any thing else moves the *Orchis* to one side, the insect-like portion falls against the anthers. At the time the little many-

* *Caleana nigrita*, Lindl. l. c. p. 54.

† The *Hinged Orchis* seems to be the genus *Drakea (Lindl. l. c. p.* 55. *f.* 3.)

flowered species of this genus comes into blossom, its leaves are withered, and the plant draws all its nourishment from the succulent nature of its flower-stalk. I pinned some specimens of this pretty little *Orchis* against the thin white curtain of a window, when the lower flowers were just beginning to open; I had the pleasure of seeing all the buds on the plant expand in succession, any thing that shook the curtain bringing the lower part of the flower in contact with the anthers. Unfortunately, you cannot see these curious plants perform their operations with the dried specimens I transmit to you of them, or you would I am sure be much delighted with them. Five fine species of *Lasiopetalum* grow on *Wallup*, of which I send you specimens.

Large masses of rock appear on the surface on the sides of the Darling range, apparently laid bare by the action of the waters of the ocean at some period of their existence, until we reach the height of the ironstone gravel formation, about 1000 feet above the level of the sea, which appears never to have been covered by the waters of the ocean. There seems to be something remarkable in the small extent of rock to be met with in this country of any one sort. In one place, when you examine one group of rocks, you may find it to be compact rose-coloured granite, very like specimens I have seen which were said to be part of Pompey's pillar; the next group, which may not be 100 yards off, is blue compact granite, or a coarse sort of brescia composed of quartz and feldspar, or micaceous slate, whinstone, hornblende, actinolite, asbestos in several forms, quartz, either massive or formed into beautiful flag-stones, or several other rocks which I do not know the names of, but I will send you small bits of them in the box. The soil is as various in character as the rocks it covers, being found richest where angular masses of whinstone appear on the surface. On Greenmount, the native *Neerdup*, there is a good deal of very rich red earth, apparently formed by the decomposition of a slaty rock resembling steatite. This rock, in its natural state, is exposed to view in the bed of the stream which runs to the north of

Greenmount, it contains large angular fragments of quartz and whinstone imbedded in it. The lower slopes of the hills, called by the aborigines *Wallup* and *Neerdup*, on strong clay soil with fragments of quartz and ironstone, produce the *Eucalyptus*, called *White-Gum* by the settlers; the cuticle is deciduous as in *Platanus*, and what remains of the bark is white, from whence comes the name; it is one of our largest forest-trees, growing with an unbranched trunk generally to 60 feet high at least. This sort of land generally yields little underwood or scrub as the settlers term it, but affords a different species of *Xanthorrhæa*, with tough and wiry leaves, which grows to the height of the common kind, but the flower-stalk is shorter, and never divides into branches. In botanical characters it comes near the glaucous-leaved *York Blackboy*, but that species I have not seen to the west of the Darling range. It is in this sort of land, especially on the banks of streams of water which run through it in winter, where our sheep, goats, and cattle, get the poisonous plant that destroys so many of them, and the prevalence of which is a greater drawback to our colony than all its other disadvantages put together. Symptoms of a strong vegetable poison are very apparent on the animals which thus die, the stomach assumes a brown colour, and is tenderer than it should be; but it appears to me that the poison enters into the circulation, and altogether stops the action of the lungs and heart. The finest and strongest animals are the first to fall victims; a difficulty of breathing is perceptible for a few minutes, when they stagger, drop down, and it is all over with them. I strongly suspect that it is the genus *Lobelia* which poisons them, and particularly the *Lobelia hypocrateriformis** of Mr Brown. I send you a paper of seeds of this beautiful plant, for it is assuredly beautiful, although suspected to be so dangerous. It produces snow-white, deep purple, and lilac flowers, and varieties of all the intermediate shades; it has a curious

* Figured in *Curtis' Botanical Magazine, tab.* 3075;—it is now called *Isotoma Brownii.*

property of growing and flowering in our hottest and dryest weather, without receiving any nourishment from the soil; indeed the roots are generally dead before the plant begins to blossom. It is an annual, and accidents do certainly occur from poison when this species is scarcely far enough advanced to be the cause of them; still, I have ascertained that in some of the worst cases, the poisoned animals had eaten a considerable quantity of this L. *hypocrateriformis*, on the day when the disaster happened. It is mostly on a dull cloudy morning, such as generally rain in the afternoon, that this misfortune takes place, but when the animals are driven and hungry, they will eat the deleterious plant at any time. If the seeds of the *Lobelia* germinate with you, it would be rendering a great service to this colony if you will have the plant analyzed. The blood of the poisoned animals is much darker-coloured than is natural, and it poisons dogs; the raw flesh poisons cats; but the roasted or boiled flesh is eaten by the natives and some of the settlers, without their appearing to suffer any inconvenience. A fourth species of *Xanthorrhæa* grows on the ironstone gravel which forms the top of *Neerdup;* it is a stemless species, with a slender flower-stalk eight or ten feet high.

Wallup produces about thirty *Proteaceous* plants belonging to different *Genera*. One of the most splendid shrubs I have seen is a scarlet *Grevillea** with multifid leaves, inhabiting the ironstone gravel; its seed-vessels and stigma are downy. A fine scarlet *Adenanthos*, always in blossom, grows on the same soil; the *Leguminosæ* are very abundant; a large scarlet *Kennedya*, with large downy leaves and big clusters of flowers, is very conspicuous among this tribe. A remarkable plant, having large cordate stem-clasping leaves and curious large bracteas, which enlarge and turn brown as the seeds come to maturity, is particularly conspicuous; its pod resembles that of *Daviesia*. The genera *Chorizema* and *Hovea* are fine; we have seven or eight species of the latter, all bearing beautiful

* Probably *G. Thielemanniana*.

blue or purple flowers. Among the *Hakeas*, Frazer's *cristata* is easily recognised by the curious bicrested form of the seed-vessel; his *Petrophila linearis* is a fine species, producing large flowers of a lilac colour, but from the size and shape of the bunches, they remind me of the English honeysuckle. The Rocky Pass, where the river Helena makes its way through the Darling range of hills between *Wallup* and *Neerdup*, displays some noble plants. One of the finest is a large scarlet *Melaleuca*, with large scarlet flowers and lanceolate leaves two inches long; a fine white Everlasting-flower, which I think is scarcely distinct from the plant called in England the *Botany Bay Xeranthemum*; and the beautiful heart-leaved and the awl-leaved pink *Everlastings* grow about the Rocky Pass. A dwarf green and crimson *Anigozanthus* (*A. humilis, Lindl. l. c. t.* 6.), is common here on the sides of the hills. Of the fragrant genus *Boronia*, two species grow at the Rocky Pass on the banks and islands in the Helena, and three on the sides of the hills. Of the equally beautiful but fetid *Bauera* I have found three kinds, their flowers smell like *Dillenia scandens*: two species of a beautiful climbing genus* allied to *Billardiera*, but having a dry two-celled many-seeded capsule, grow in the islands and three more species of the same genus, some of them very sweet-scented, inhabit the sides of the hills. The native *Yam*, a true *Dioscorea*, the finest vegetable this country naturally produces, with seven or eight species of *Hæmodorum*, constitute the principal food of the natives in the way of vegetables; they eat the roots; all the species are mild and nutritious when roasted, but acrid when raw. The islands about the Rocky Pass produce a curious shrub with oblong downy leaves and clusters of flowers collected in a common calyx as in *Syngenesia*; as nearly as I can ascertain, each individual flower has 10 stamens, a style, and a seed-vessel resembling *Rutaceæ*.†

* Probably *Spiranthera, Hook. in Bot. Mag.* (*sub. t.* 3523), or *Pronaya, Endl.*

† *Eriostemon, Vide Lindl. l. c. p.* 17. *Chorilæna quercifolia* (?)

In thus giving you an account of a few of our more remarkable plants, I forgot to notice the only indigenous *Palm* in this part of the colony, it grows to ten or twelve feet high, and about two feet diameter; the fruit of the *female palm* is like a large pine-apple, it contains many nuts about an inch long, covered with red-coloured arillus, which is a favourite food of the natives. To prepare the nuts and arillus for use, they steep them in water or bury them in the earth for some weeks, where they undergo a sort of fermentation and become wholesome food; when eaten without this preparation, they produce violent vomiting and other dangerous symptoms.

HAWTHORNDEN FARM, TOODJEY VALLEY,
July 25th, 1839.

I HAVE lately crossed the country from the sea-coast to the district called by the aborigines *Guangan*. I believe *Guangan*, in the native language, signifies *sand;* but I mean by it the open sandy desert which commences at about eighty miles E.N.E. from Freemantle, and is known to continue in the same direction for two hundred miles. It is curious to observe the effect the strong winds from the sea have on different plants; the beautiful blue *Kennedya*, named after our late governor, (although I do not know how it differs as a species from *K. Comptoniana*,) on the downs near the coast forms an upright bushy shrub, generally about three feet high, with shining trifoliate leaves, the whole plant covered with beautiful flowers, and having no appearance of being a climber. It is however easy to see that the same species gradually changes into the quinquefid variety, which then runs to the top of trees twenty feet high.

This is just the commencement of our flowering season. A pretty *tetrapetalous monœcious* plant, which I think forms a new Genus, is now in full bloom on the sandhills; I have met with three species of it. Two species of *Pterostylis* are in blossom on the limestone hills; of one of these there are

two varieties with brown and with green flowers striped with white. This genus has a leafy stem with several flowers, the stigma moves like a hinge, but only in a slight degree. At the time the flowers are in perfection, the heart-shaped lower lip (which I call the stigma) lies up against the anthers, by which it entirely closes the mouth of the helmet-shaped corolla; if the stigma is carefully brought down, I have observed it to shut again several times. A pretty red-flowering plant belonging to *Epacrideæ*, and the beautiful red and yellow *Leschenaultia*, which seems to be always in blossom, with *Banksia Menziesii*, are now in flower. Many kinds of *Daviesia* and *Acacia* are at this time in great beauty, also a species of *Hovea*. The *Cyperaceæ* must, I think, be an extensive Order at Swan River; I have already got about thirty species of the Genus *Lepidosperma*. A pretty red-flowering species of *Utricularia* now in flower, adorns the sandy land near the foot of the hills: it is only about an inch high, and the flowers are nearly as long as the footstalk or scape. I went with our cart across the hills by the Toodjey road, as far as *Goolongine*, a native well about thirty-five miles from Guildford. The blue *Kennedya*, which I have already mentioned, (p. 346), disappears altogether as we approach the hills; but its place is well supplied with a large downy trifoliate species, producing large clusters of scarlet flowers. In the Swan River district, this plant is rather of an upright habit, and not much of a climber; but I do not know how it differs specifically from the many-flowered red *Kennedya*, which grows at Augusta and King George's Sound; that plant climbs and creeps extensively, spreading often on the ground; the leaves are smaller, thinner and smoother, the seeds much less, and the seed-vessels smoother. I have lately met with the King George's Sound plant near the half-way house on the York road. Baron Hugel's *K. arenaria* grows plentifully all over the great plain of *Quartania*, that is between the sea-coast and the foot of the Darling range; but what I have always considered the same species, is seen in abundance all over the York country, answering well to the

description of *K. prostrata*. The whole plant is only about half the size, and the seed-vessels smoother; I send you the two sorts so that you may compare them. Four kinds of *Hakea*, belonging to Mr Brown's second division ("folia plura filiformia"), are now in flower; and our beautiful crimson species, together with several others belonging to his third division, are also in bloom. A beautiful green-leaved *Daviesia* grows all the way from the sea-coast to the level of the ironstone gravel formation on the top of the hills; but there the green-leaved variety disappears, and a very glaucous species or variety takes its place. The latter plant grows stronger, and has harder foliage, but the two are so alike in every other respect, that I think they can scarcely be distinct. We saw nothing but the glaucous-leaved plant for six or seven miles, when on descending from the first range of hills, we found the green one for several miles about the level where we left it. Again the glaucous plant occurred on the top of all the hills where the ironstone gravel appears to have been undisturbed by the waters of the ocean, while the green species was found no further to the east than the last named habitat. A large *Eucalyptus*, with a very rough bark, generally charred on the outside, from which it has got the name of *black bark* by the settlers, grows plentifully about the Warrilow, our half-way house that is to be on the new Toodjey road; the leaves and flowers are something intermediate between the *Red-Gum* and *Mahogany*. I stopped for a day behind the cart at *Goolongine*, to examine some ironstone hills, which I knew to produce several fine plants. The largest and one of the finest species of *Petrophila* I have met with, inhabits the top of a hill about a mile east from the well, it varies with linear entire leaves, and leaves deeply trifid with linear divisions; the flowers are a golden yellow. I measured one small tree twenty feet in height, with a clear stem four feet high and six inches in diameter. I send you specimens collected last year, the plant is not yet in flower. A fine long-leaved upright-growing *Dryandra*, about twelve feet high, grows within sight of the road where it begins to descend

into the valley of the Avon; and by following the ridge of the same hill for about a quarter of a mile to the south-west, another beautiful species of the same Genus was detected, having flowers like the Cape Honey bush. That is the only spot on which I have found the last kind; it attains from four to six feet in height among dense bushes; I send you specimens of each. The valley of the Avon lies about five miles east from the top of this hill. A beautiful *leguminous* plant grows on the banks of the river, known as the *native Lupine* by the colonists; I think it is a purple-flowered *Astragalus*, the spikes of flowers are nearly a foot long, the leaflets bear some resemblance to the common blue and rose Lupine, whence comes the name; also the *Nut-tree*, a species of *Sandal-wood;* and the *Acacia,* styled by the settlers *Raspberry jam*, in allusion to the smell of its wood, (the natives call this tree *Mangart*,) the wood is very valuable, I understand it has been sold in London at the rate of 2*s*. 6*d*. per lb.: likewise the *Acacia*, called *Manna* by the natives, which produces a great quantity of gum resembling gum-arabic in the dry season, forming an important article of *their* food: all these are common in the valley of the Avon. The soil here in the valley is generally a light sandy loam, of a reddish colour, and yields grass of various sorts in tufts, generally nine inches or a foot asunder; but the land is very unlike the meadows of England. It takes three acres on an average of our best land to keep a sheep throughout the year; when manured or sheep-folded, it affords from fifteen to twenty bushels of wheat per acre. There are some tracts, generally of small extent, of hard clay, which produce the *White Gum*. The *Eucalyptus*, found on the sandy loam, is called by the settlers *York Gum*, by the natives *Doatta*, they use the bark of the root as food in the dry season, chewing it along with the gum of the *Manna*. The *White-Gum* forests afford an umbelliferous plant with very small tops, and with small setaceous leaves, but it has very large tuberous roots, sometimes three or four inches in diameter or more; the natives eat this root, which they call *Conna;* it is very juicy, the juice having a

sweetish taste, with a slight flavour of Celery, the root seems to contain very little starch or mucilage.

The tops of the ironstone hills in the Toodjey district produce a beautiful species of *Acacia*, with large oval leaves, which remains a long time in blossom. The plant called by the settlers the *native Myrtle*, grows in Mr Leake's Grant: it is an *Acacia*, and certainly bears some resemblance to the Myrtle in its foliage and habit. On the same hill where the *Acacia* grows, and where the road crosses it to Waylen's Grant, the *Nut-tree* produces a red-flowering *Loranthus*, its foliage so like the tree on which it grows as to be easily overlooked. This species is very rare. Between Waylen's road and Guangan, I met with a new cream-coloured species or variety of *Anigozanthus*.

I was accompanied by my youngest son, Johnson, who collects and preserves the birds and insects of this colony; the open sandy country is bordered by a considerable forest, composed principally of two kinds of *Eucalyptus*, called *Urac* and *Morral* by the aborigines. The *Urac* was in full bloom, but it seemed no easy matter to procure specimens, the trunk of the flowering-trees being sixty feet high, very smooth, and of a yellow colour. My son and I tried several plans without success. At length I thought of firing a ball across the top of the tree, and the first shot brought down plenty of specimens. This *Morral* is said by some to be the tree called *Stringy-bark* in Van Dieman's Land. I suspect it is rather a nearly allied species, both these *Eucalypti* being easily split. One of the most conspicuous plants on Guangan is a shrubby *Eucalyptus*, with large glaucous coriaceous foliage, and conspicuous red flowers, succeeded by large seed-vessels. I have observed a white-flowered variety of the same. We were too early in the season to find many plants in bloom. I gathered a fine *Boronia* with awl-shaped leaves, and several *Acacias* in blossom; but the specimens I send you from Guangan were mostly collected last year. Among them you will find a beautiful *Grevillea*, its large yellow spicate inflorescence being nearly a foot long; the natives collect the flowers and

suck the honey from them: they call them *Woadjar*. About five miles after entering the district of Guangan, we met with a *Melaleuca* which we had never seen or heard of before; it grows about two feet in diameter; I send you specimens of its bark. By inserting the point of a sharp stick under the layers of cuticle, a considerable quantity of water rushed out; I collected a cupfull of it, but found it as bitter as gall. If this *Melaleuca* proves to be a new species, it may well be called *amara;* we saw native huts covered with its bark.

August 3*d*.—I have been another excursion to Guangan, accompanied by a native called *Yarangan*, to examine the banks of the Salt River. The bed of this river is from twenty to thirty feet wide, the water is now standing in it in pools; when these pools become dry, salt, eight or nine inches in thickness and of good quality, is found in their beds. On this journey we travelled east by north, and met in about twenty-five miles the Salt River just before it enters the grassy country. The *Hibiscus hakeæfolius* of Hügel, is plentiful on its banks; and a fine species of *Grevillea* growing eight or ten feet high, with fan-shaped bifarious branches, and long quinquefid leaves: the plant grows in a pyramidal form like a young Spruce Fir tree, the old seed-vessels appear as if they had been downy. I met with some seed-vessels on the fine yellow *Grevillea* I sent you from Guangan; they are flat for this genus, and covered with short hairs; three other *Grevilleæ* which I had not seen before, were growing on the banks of the Salt River. I send you bits of them, but they were only coming into blossom, and without seed-vessels. Before we entered Guangan, we crossed some very rugged ironstone hills with sandy valleys between them, thickly clad with shrubs of various sorts. On the slope of one of these hills, I found a species of *Banksia* which I had not noticed elsewhere, its leaves are entire and glaucous, with sharp points; I send you the old flowers and seed-vessels: the plant grows from two to three feet high in spreading bushes. The beautiful *pink Cockatoo*, named after Mr Leadbetter, is common in this part of the country. These birds come in flocks to the neighbour-

hood of the Avon to feed on the seeds of the *Blackboy* and flowers of the *Red-Gum;* the natives tell us they breed in the tops of a very high species of *Eucalyptus* which they call *Mallert*, and which grows a day or two's journey to the east of where we were: the *black Cockatoo*, with red bars across the tail, is reported by them to breed in the same tree. My son shot a species of blue-bird which we had not seen before, it has broad white bars across the middle of the wings; we saw only one cock bird followed by eight or nine hens, it is rather smaller than the common blue-bird. The *Xanthorrhæa*, which I call the *York blackboy*, grows sparingly in this district on the tops of the hills; its flower-stalk is only about half the length of the common species, the leaves are very glaucous, and so tough that they can with difficulty be broken off by the hand; it grows from twenty to thirty feet high without a branch.

Among these vallies and ironstone hills, I met with two *Dryandras*, new to me—a *Petrophila*, two *Hakeas*, three *Grevilleas*, and a *Synaphea*, which I had not seen before; but few of them were yet in flower. A curious downy-leaved plant like a *Stachys* was coming into bloom. Another individual of the same genus grows at the foot of the hills. Fresh water is scarce on Guangan, even in this our rainy season; it is an undulating country, the hills generally small and low, the soil on them a stony clay, they produce several *Eucalypti*. The vallies between these hills are generally extensive and sandy, covered thinly with small shrubs. Kangaroos of the large species, the males when full-grown weighing 100 lbs. and upwards, are seen in hundreds on these sandy plains. We have nine species of *Kangaroo* at Swan River. The animal called *Dolgitch* by the natives, evidently a species of *Kangaroo*, burrows in the ground, and, except in its tail, has a good deal the appearance of the European *Rabbit*. The native *Burdit* also burrows in the ground or lives in holes in the rocks. Our dogs caught a small kind of *Kangaroo*, with a horny substance like a claw on the point of its tail; the natives call them *manang*, and say

they are common to the north. A *gallinaceous bird*, about the size of the common domestic hen, called *Nau* by the natives, breeds on Guangan; these birds make large nests in the sand and lay many eggs, they eat the seeds of the different species of *Acacia*, and sometimes come into the valley of the Avon with the *bronze-winged pigeon* to feed on them.

The natives use several species of *Boletus* as food; two of the principal they call *Numar* and *Woorda*, the latter I think might be advantageously substituted in cultivation for the *common Mushroom*, as it has the same flavour and is much easier of digestion. The stem is in the middle of the pileus, which is about six inches broad and two inches thick, it is of the colour of rusty iron above, and orange underneath, the pores very small; it turns to bright blue when bruised and exposed to the air. The *Numar* has the stem at one side, it divides into several lobes, and when full-grown weighs many pounds, it is only seen near the roots of *Mahogany-trees*, and seems to be parasitical; it is highly esteemed as food by the poor natives.

HAWTHORNDEN FARM, TOODJEY VALLEY,
October 14*th*, 1839.

SINCE writing the few observations dated on the 3d of August, I have made another journey to the sea-coast, and accompanied by Mr Preiss the German botanist, Mr Gilbert, who is collecting birds for Mr Gould's* work, and Dr Walker, attached to Mr Grey's surveying and exploring expedition, I visited the island of Rotnesst, the largest and farthest out to sea among the islands of this part of the coast. It contains lakes of salt-water, now cut off from the ocean by sand-hills, where much salt is collected in the dry season. The island is of the secondary limestone and calcareous sandstone formation, the tops of the highest hills are about 300 feet above the level of

* The distinguished Ornithologist, author of the "Birds of Europe, of the Himalaya," &c.

the sea. For twelve or fifteen feet above the water, the strata in the calcareous sandstone are placed very close together, there being ten or twelve of them in a foot of perpendicular height; they lie horizontally, unless where masses of the rocks have been undermined by the waters of the ocean, and have fallen in various directions. I observed a black coloured limestone, resembling marble, also a grey kind spotted with black and striated with black of the same description, but the great mass of the hills consists of calcareous sand, very imperfectly changed into stone. A crust of limestone, seldom more than two or three inches thick, is generally found near the surface in the low parts of the island, and it extends, but more unequal in thickness, over the very tops of the hills. In this crust may be seen what appear to have been the trunks of large trees with a foot or two of them remaining where they seem to have grown, but now changed into solid limestone; in many places the calcareous sand has fallen away, and left the roots of the trees now converted into stone, remaining just as we see the roots of trees on the banks of mountain-rivers that are undermined by the current. The soil in the vallies of Rotnesst is a rich calcareous sand, with a large portion of vegetable mould, and the plants found on the island are nearly the same as grow on Garden Island. We found a fine *Boronia*, likewise an inhabitant of Garden Island, flowering on the exposed western coast of the island; its leaves are pinnated, with winged foot-stalks, it smells strong, like the European *Rue*. A small arborescent *Pittosporum*, bearing yellow berries, which was in flower with ripe fruit at the same time; the *Garden Island Cypress* in flower; and the *Myrtaceous* tree, with a parasitical *Loranthus*, but not in bloom; these are the principal timber-trees of the island. Neither *Xanthorrhœas*, *Eucalypti*, nor *Proteaceous* plants could be seen, although species of these genera grow close to the shore of the mainland. A showy *Rutaceous* plant, having its drooping scarlet flowers collected in a common calyx,* was in

* *Diplolæna Dampieri*, Desf.

flower on the island; and on the coast of the mainland, a fine white-flowering Mallow-like plant, resembling the *tree Mallow*, found on Garden Island and on Carnal. A *Lasiopetalum*, with hoary *linear* leaves and lilac flowers, was in full bloom, different from any I have seen on the mainland. I also met with a splendid rose-coloured species in flower, on the tops of the ironstone hills near the Salt River, the leaves are in whorls of three to each set; and a pretty white-flowering one which is found on Guangan, has the leaves arranged in the same way; we have got sixteen or seventeen species of this genus at Swan River, most of them beautiful plants. We searched in vain on Rotnesst for the beautiful scarlet *Chorizema*, which still grows on Arthur's head, but flowers in much greater perfection on the coast near the Clarence road, about four miles to the south of Freemantle. It is distinct from the *holly-leaved Chorizema*, found at the Rocky Pass, its leaves being larger, more *coriaceous* and downy underneath, and the plant spreading more along the ground; these are two of the finest plants belonging to this numerous and beautiful Order. I met with a curious *monadelphous** plant in flower near the foot of the hills, it resembles *Stachys lanata* a good deal, but has the leaves closer set in a decussated form; the flowers are in dense round downy spikes, the only part of the flower appearing above this downy mass being the anthers, five or six in number, and united together at their base by a membrane which some may perhaps consider as the true corolla. I crossed the hills by the Toodjey road, and found a beautiful *Hovea* which I call *H. grandiflora*. The only habitat I know for this plant is the west side of a hill, which the road crosses about a mile to the east of the watering-place called *Goolgoil*, by the natives; the leaves are oval and very entire, the flowers varying from deep to light blue, allied to *H. Celsii*, but twice as large. Many *leguminous plants* are now in great perfection, belonging to different Genera, the prevailing colour of their inflorescence

* *Amaranthaceæ*: nov. gen.

being a mixture of red, orange, and yellow. A pretty *Orchis*, which I cannot refer to any of Mr Brown's genera, is now in blossom on the roadside; it is remarkable for producing varieties with blue, yellow and white flowers. I am acquainted with two other species of the same Genus, with blue flowers, varying to white; but this is the only instance I can recollect of a blue flower changing into a yellow; the yellow kind is very rare to the west of the Darling Range of hills, where the blue is common; but in the Toodjey district some of the hills produce the yellow plant in thousands, without any mixture of blue; still I am satisfied they are the same species. My family have paid a good deal of attention to the *Orchideæ*, and we have gathered between sixty and seventy species; the few botanical books I brought out with me having been soon lost by a fire, we consequently knew nothing of the names of even the Genera, but every *Orchis* we found for the first time was new to us, and were distinguished among the different members of the family by the finders' names, such as Jane's yellow spiral-leaved, John's spotted spiral-leaved, &c., &c. My youngest daughter, Euphemia, knows the Swan River *Orchideæ* quite as well as I do myself, and she is able to tell any of her brothers who pick up an *Orchis*, whether there is any chance of its being what *we call* a new one or not. Some of our genera, for we found it necessary to make genera to help in distinguishing the different species, turned out to be exactly the same with Mr Brown's. Our *glazed Orchises* were Mr Brown's genus *Glossodium*, but we named the plants from the remarkable glazed or glossy appearance of the flower, and not from the part of the flower resembling a serpent's tongue. Two or three of our *Orchideæ* are very rare, and have not been seen more than once or twice, and we have no specimens of them; all the rest I can send you. One species came up in considerable numbers one season, in a place where clay had been dug to build with, close to our residence on the Swan River, and was found by my youngest daughter; but the specimens were unfortunately lost, and it has never been seen since, although

often looked for this season. We have added five or six to our list, one that I have found is a splendid species of Mr Brown's *Caladenia* which grows two feet high, the three outer divisions of the perianth are more than two inches long, the two side ones shorter, of a yellow colour variegated with red, they are sickle-shaped and turn round their points, so that they act as a sort of guard to the lower lip, which moves on a hinge. In this species the lower lip is heart-shaped, with a dark purple curled insect-like point; the throat is filled with purple glands, the two sides smooth and yellow; when undisturbed, the lower lip lies up against the anthers until after impregnation, but when the plant is moved a little to one side it falls down. Another, which I have gathered this year for the first time, is a *Pterostylis*, which I have named *P. rupestris*, from its growing in the crevices of horn-blende rocks, where there is scarcely any earth; it bears four or five flowers, and has the stem covered all the way up with sheathing scales; the lower lip moves as in the *Pterostylis* which inhabits the limestone rocks on the coast. A third *Orchis*, also detected this season, forms a different genus from any we had seen before; its lower lip resembles an insect, and assumes the appearance of a head and feet, which none of the other insect-like *Orchideæ* have. The other *Orchideæ* found this season are small; they were gathered by my youngest son when out kangaroo-hunting. I have only seen them in a dried state. This is now the gayest season of the year at Swan River; the grasses are mostly in flower, the birds are breeding, and singing from daybreak in the morning until dark; the grassy districts are covered with the *pink*, *yellow*, and *white Everlastings*, and other annual plants of this class. There is a curious little plant now in bloom, which I think is nondescript; (I have since met with two more of the same genus;) I suspect it belongs to Mr Brown's genera *Aphelia* or *Devauxia*, and in a natural arrangement will be placed near the *grasses;* it has a few setaceous leaves like a very small grass, and from twenty to thirty flower-stalks about an inch high; the head of flowers bears

some resemblance to a single cluster of the inflorescence of *Briza media*, the flowers resemble those of a grass, they are monandrous and have each a single seed; it would perhaps come into Jussieu's Natural Order *Cyperaceæ*. I have met with one or two species of *Hippuris* at Swan River, also a *Callitriche*, I believe the common European kind, but Mr Brown has not noticed either of them in his work. I have been to Guangan to the habitat of the paper-bark tree I mentioned before, but it is not yet in blossom. A species of *Comesperma*, having greenish-yellow and purple sweet-scented flowers and stout woody stems, grows with it, and forms the strongest creeper I have met at Swan River. My youngest son, who is very fond of flowers, was much pleased with a pretty *Pelargonium* he saw here for the first time; it has long tuberous roots, which lie about three inches under the surface, small heart-shaped leaves growing close to the ground, and a flower-stalk about three inches high with large (for an Australian *Geranium*) white flowers, striated with red; the plant is sweet-scented. We have three *Erodiums*, one with white, one with purple, and one with rose-coloured flowers, and very strong smelling leaves; one *Geranium*, like *G. molle*, with a perennial root, shaped like the carrot which the natives eat, and another rose-coloured *Pelargonium*, which I suppose may be the *P. Australe*, these form our whole list of *Geraniaceæ* yet met with. The *Musk-scented Erodium* is naturalized on the Peninsula farm. We detected a curious plant, with the habit of *Thymeleæ*, having snow-white downy calyces resembling a *Pimelea*, but the divisions of the corolla are not so deeply cleft, and they do not expand so much as they do in this genus or *Daphne*, it grows about a foot high with hoary leaves, the flowers are several together, closely envelop-ed in down, with only the tubes of the corolla rising over the downy mass. The Natural Order *Goodenoviæ* produces some of the finest plants at Swan River; an annual resembling a *Scabious*, belonging to it, perhaps Sir J. E. Smith's *Brunonia sericea*, with sky-blue flowers, is now in full bloom in the grassy districts, covering many acres, and forming

a fine contrast with the pink, yellow, and white *Everlasting-flowers;* this plant would be likely to answer in the open air, as an annual, in England. The splendid celestial-blue *Leschenaultia* is now in high beauty. Another species with bright scarlet flowers is just coming into blossom on the banks of the Salt River, and near Mr Hall's residence on the Avon; this may be the *L. formosa* of the *Botanical Magazine;* it grows about two feet high, with yellowish-green leaves, and is very distinct from a species called by me *Leschenaultia sanguinea,* with blood-red flowers, found on a swampy plain, called *Darga,* by the natives, at the head of the Helena River. The *L. sanguinea* is only five or six inches high, with glaucous foliage; the tube of the corolla is shorter and not so downy, the divisions of it broader and fuller, and it flowers two months earlier than the species I suppose to be *L. formosa.* I have been up the Avon about forty miles from the Toodjey, to Mount Bakewell, the highest (being about a thousand feet above the level of the ocean) and most conspicuous hill in the vicinity of York; the base line for surveying the York district passes over the top of Mount Bakewell. I met with a blue-flowering *Orobanche,* growing among stones near the summit of the hill; another I found in 1837 in seed, or it may be the same species, on sand-hills near the coast. A curious plant belonging to *Polygaleæ,* and called by settlers the *Swan-River Broom,* and which I suppose to be a species of *Comesperma,* I have called (from the use made of it) the *Comesperma scoparia.* This was in flower on the only spot where it has as yet been seen, and where it will, judging from appearances, soon be destroyed; it grows on a low sand-hill, on what was originally Mr Edjet's grant, between Mr Edjet's first residence and the river: it affords an excellent ready-made broom, the root forming the handle; full-grown specimens are about two feet in diameter, growing in dense upright bushes about two feet high; green branches are thrown up every year to the outside of the plants, which, when they exceed two feet in diameter, begin to decay at the heart. The plants in greatest demand for brooms measure about nine inches in

diameter, and are shaped exactly like a well-made broom; the branches are very tough, without leaves, and the flowers blue. I shall send you one of these brooms as a specimen; the natives supply all the settlers within ten miles round with them, thus threatening to extirpate the plant, and many have even been sent to Perth. I met with a *leguminous plant*, new to me, on the grassy hills near Mr Lucas's residence, which I think better adapted for cultivation as artificial food in this country than any hitherto introduced; it is not yet in flower, and from its present appearance it will continue green for several months. The plant, called by the settlers the *Swan River Lupine*, is now in full bloom in many places on the banks of the river; it is three or four feet high, the leaves are downy, about seven inches long, pinnate, having six pair of pinnules with an odd one at the end, the leaflets about an inch long, and half an inch broad; the flowers are borne in spikes about a foot long, produced from the axils of the leaves, they are mutable in colour, first making their appearance of a yellowish-white, and then changing to a beautiful purple hue; the seed-vessel and seed resemble *Astragalus*. (*Cyclogyne canescens*, Benth.)

The cream-coloured *Anigozanthus*, found between Waylen's road and Guangan, seems not distinct from the early orange, or only a form of it, and I have met with another variety of the same species on the downs near the sea, about ten miles to the north of Freemantle. The three varieties are as follows:—1st. The early orange, which grows on the sand-hills, between the Swan River and the Darling range; this plant springs up singly, and is about nine inches high, with orange flowers, and is the earliest of the genus; it has one or two large leaves near the ground, from the axils of which the flowering branches are produced (besides the main stem). 2nd. The sea-coast variety, attaining about a foot high, a strong plant bearing many flowers; there are four or five large leaves on the stems, from which flowering branches are produced, the flowers are often yellow, or yellow variegated with orange; and 3d. the cream-coloured variety, which grows two feet high,

with two or three flowering branches from each root; the stems have two or three large leaves which produce flowering branches from their axils, the inflorescence is of a beautiful cream colour, but frequently marked with orange near the mouth of the corolla.

HAWTHORNDEN FARM,
October 30*th*, 1839.

I have been another journey to the Salt River. The fine yellow *Grevillea* and the pyramidal species were in full bloom; the flowers of the latter are of a greenish colour, the most conspicuous part being the stigma, which is quite black; the seed-vessels are downy or hairy in both species. I found a remarkable black-flowering plant in blossom on the banks of the Salt River; the habit of this plant, the size and appearance of its leaves, closely resemble the Cape *Sabæa aurea;* the corolla is notched, about the breadth of a sixpence, with five stamens, smooth in the middle, but velvety near the outside of the circle, as black as ink; the flowers are numerous, produced singly from the axils of the leaves, the seed-vessels were not far enough advanced to ascertain their structure, but I do not think that they will agree with *Asclepiadeæ*, to which Order the flower bears some resemblance. In this journey I found the beautiful *Leschenaultia*, which I suppose to be *L. formosa*, producing rich dark purple inflorescence, also light purple, lilac, and white, blood-red, bright scarlet, pink, rose-coloured, &c., through every possible intermediate shade of purple and scarlet. It is curious to observe the great variety that prevails in the colour of the flowers of the same species in many plants of this country. In the first part of this journal, I pointed out the great variety in the colour of the flowers of *Lobelia hypocrateriformis.* A pretty annual plant, like an *Anthemis*, exhibits as many hues in a state of nature, as the *China Aster* does in a cultivated state. Most of the *Everlasting-flowers* display yellow and white varieties,

equally common in different parts of the country; the plant called *Botany Bay Xeranthemum* in England, is found with yellow flowers in the Toodjey district, and white ones to the west of the Darling range; an annual *Gnaphalium*, very frequent in the Toodjey district, with long-pointed squarrose scales on its heads of flowers, varies with iron-red, orange, golden-yellow, straw-coloured, and white, also rose-coloured flowers of several shades. I found a *Prostanthera*, with dark red flowers, on the banks of the Salt River; and, in the bed of the same river, a curious *Malvaceous plant* with creeping roots; the calyx is single and the corolla adheres closely to it, when in flower, apparently attached to it by a sort of gummy substance; the divisions of the corolla are narrow, and look like white stripes on the calyx; when the seeds are formed, the corolla is found separate from the calyx. A curious *grass* with rush-like and very prickly leaves, makes it no very easy matter to botanize on the banks of this inhospitable river; its culms grow four or five feet high, the fructification is borne in a sort of contracted panicle, the calyx is of two glumes bearing five or six flowers, the flowers grow mostly from one side of the panicle. Another remarkable grass with large calyx-glumes was growing on the banks of the river; the glumes contain four or five seeds with curious wings for flying with. I send you specimens of both these grasses.

JAMES DRUMMOND.

SOUTH AFRICAN PLANTS.

Dr Krauss, a Prussian Naturalist, has lately arrived in London with a very extensive collection of skins of animals, well preserved Insects, Amphibiæ, &c., and a large herbarium of plants from the *Natal country;* the duplicates of the last, amounting to between four and five hundred species, are offered for sale, at the price of £2 the hundred. We trust

shortly to lay before our readers an account of the journey of Dr Krauss into Natal, a district which he visited after having made collections in the Cape territory.

ARRIVAL OF MR CUMING FROM THE PHILIPPINE ISLANDS.

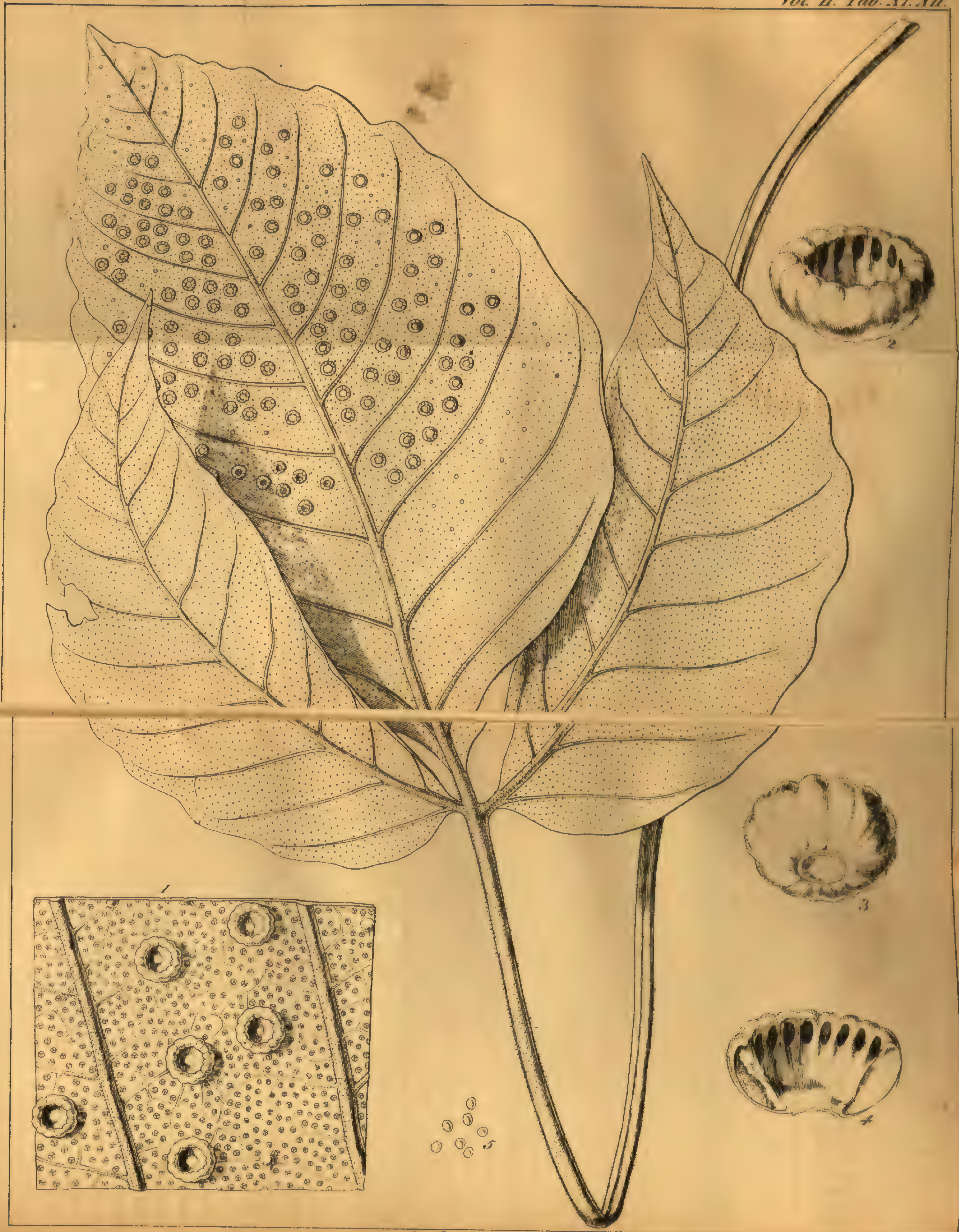
This enterprising Naturalist, who first distinguished himself by his voyages and collections made in the islands of the Pacific, and on the western shores of South America, to which the pages of the *Botanical Miscellany*, and the early numbers of the present work, bear honourable testimony, has recently returned from a long visit to the Philippine Islands made for a similar purpose as his former voyages, that of increasing our knowledge of the natural productions of a group of islands, little trodden by men of science, and singularly rich in the several departments of nature. Alive to the importance of every department in the wide field in which he was engaged, and wholly neglectful of none, Mr Cuming had the judgment to devote his attention mainly to two branches, Botany and Conchology, in which, as may be expected from so acute and so experienced a traveller, his collections are eminently valuable and extensive, in each of the two departments, the numbers of species being estimated at between three and four thousand. Again, in Botany, Mr Cuming had his favourites, these were the Ferns, and there is reason to believe that save the rich stores of that family made by Dr Wallich and his assistant, during a period of many years in all parts of the East Indies, no such collections have ever before been brought to Europe by any single individual. It is well known to Botanists, that amongst Dr Wallich's Ferns, the rarest and most interesting one was that which has been figured and described by Mr Brown in the "*Plantæ Asiaticæ Rariores*," under the name of *Matonia pectinata*,* of which a solitary specimen was gathered by Sir

* See also Hooker's Genera Filicum, Tab. LIX.

William Farquhar on Mount Ophir, thirty-six miles from the town of Malacca. This Fern, which excited so much interest a little before Mr Cuming's departure, he pledged himself to rediscover and to supply our Herbaria with fine specimens. He has kept his word, and the same letter, addressed to me, which announced his arrival in London, (June 5th,) mentioned this interesting fact. "It is with pleasure, my dear Sir," he says, "I have to inform you of my safe arrival here this morning from Singapore, with all my collections I trust safe, and in as good condition as I am in health. Since I did myself the honour of writing to you last, I have been at Mount Ophir, in the Malayan Peninsula, and have had the gratification of collecting the splendid Fern which I promised you to do before I left Europe. It is not found at the foot of the mountain, as I had understood, but upon the mountain, and there in great abundance, at an elevation of 4600 feet above the level of the sea. Its roots creep along the ground, and each frond stands from five to seven feet high."

The Philippines have afforded Mr Cuming nearly 400 species of Ferns; and on his return, in one short excursion into the interior of St Helena, during part of a single day's stay there, 15 species rewarded his researches.

The pages of this Journal will shortly contain many interesting particulars relative to Mr Cuming's investigations in this magnificent group of islands, and we shall therefore content ourselves at this time with saying, that while on the one hand, we know it to be Mr Cuming's intention to present the most distinguished public Institutions of this country with some of the fruits of his toils, on the other hand, he offers to private individuals the means of enriching their museums by the purchase of collections on similar terms with those that attended the distribution of his South American Plants, &c. It will yet necessarily be some weeks before the numerour chests can be unpacked, and their contents arranged for inspection and distribution; but due notice of this will be given in our Journal.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XX.—*Description of a New Species of* Kaulfussia, *found in Upper Assam.* By William Griffith, Esq., Assistant Surgeon, Madras Establishment.

[With a Figure, Tab. XI. XII.]

(Of this very rare genus *Kaulfussia*, one of the most remarkable of the Order *Filices*, the original species was detected and named by Blume. A second species has recently been discovered by Mr Griffith in Assam, and described in a Memoir published in India, which that gentleman has been so good as to send us. The description refers to a figure which, as it appears, should have accompanied the Memoir, but I do not find that any of the copies sent to this country possess this plate. Through the kindness of the Honourable W. H. Harvey, we are enabled to give a figure from an authentic specimen in his possession. The description is quoted verbatim from the work above alluded to.—Ed.)

KAULFUSSIA. *Blume.*

Ord. Nat. Filices. Marattiaceæ. *Kaulf.*

Syst. Linn. Cryptogamia. Filices.

Char. Gen. *Capsulæ* sparsæ, exsertæ, orbiculari-cyathiformes, multiloculares. *Indusium* nullum.

Filices *frondibus ternatis amplis, subtus stomatibus maximis aperti quasi perforatis, stipitibus basi bisquamatis, capsulis subsessilibus.*

Kaulfussia *Assamica* (Griff. in Mem. on *Kaulf.*, cum Ic.) fronde triphylla, foliolis subsessilibus, stipitibus teretibus, capsulis sub-20-locularibus, loculis per dimidiam longitudinem tantum dehiscentibus.

Hab. In rupibus arenosis solo alluviali tectis Assamiæ Superioris, ad basin collium Nagensium Gubroo Purbut propinquis, ubi copiose inveni mense Martii 1836, umbrosissima amat.

Rhizoma subterraneum, longe repens, crassum, carnosum, infra radiculas teretes, tortuosas, simplices ramosasve proferens, supra ad basin cujusque stipitis in squamas duas persistentes, carnosas, quam maxime papillosas (junioribus imbricatim conniventibus et frondem nascentem obtegentibus) quasi ruptum. Superficies papillis conicis magnis pilisque cellulosis

irregularibus septatis asperata. *Stipes* pedalis, aliquando sesquipedalis, teres, basi incrassatus, papillis pilisque supra descriptis valde scaber, pilis rarius stellatis, sæpe ramosis, squamis badiis minimis peltatis raro immixtis. *Frons* ampla, ternata, ambitu deltoidea, novellæ gyratæ intra frondis substantiam formatæ, demum erumpentes pilis ramentisve rubris hispidissimæ. *Foliola* subsessilia, oblongo-ovalia, acuminata, carnosa, subintegra, supra sordide viridia lævia et glabrata, infra albida, oribus magnis elevatis innumeris stomatum officio fungentibus quasi papulosa, et ad venas, ultimis exceptis, modo supra descripto scabra, lateralia margine superiori obliqua.

Venatio: venæ primariæ (*costæ*) crassæ; *secundariæ* apices versus arcuatæ et ope venularum mutuo nexæ, vel magis distinctæ; apice utriusque cum vena secundaria superiore confluente, *tertiariæ* vix prominulæ; *intervenia* cæterum varie irregulariterque reticulata; terminatio venularum ultimarum obscure clavata, vel intra-marginalis, vel intra areolas. *Capsulæ* (*sori* cel. Kaulf.) maximæ, sine ordine evidente per totam paginam dorsalem frondis sparsæ, irregulariter seriatæ vel sub-biseriatæ, sitæ in confluentia venularum tertiariarum et ultimarum, subsessiles, cyathiformes, superficie externâ tot exaratâ sulcis quot locula, margine paullo incurvato sub lente crenato, crenaturis fissuris dehiscentiæ oppositis: loculis viginti vel ultra, verticalibus, ovatis, a medio supra usque ad apicem rimâ introrsum dehiscentibus, extus lutescentes, intus luteo-badiæ, utrinque rubro-punctatæ, siccatione rugosæ. *Sporulæ* in acervulo lutescentes, rotundatæ vel subreniformes, sub lente centies augente minutissime scabrellæ. *Anatomia*. Radices cellulosæ, fasciculo vasorum unico centrali fibris circumdato. Rhizoma e maxima parte cellulosum; cellulæ rotundatæ, pressione angulatæ, plurimæ, parvæ, succo rubro-rosaceo turgidæ; lacunæ paucæ interjectæ sine ordine evidente. Fasciculi vasorum plures, sparsi, peripheria fibrosi centro ductiferi; ductibus plurimis, vix solubilibus, simpliciter trabeculatis. Stipes etiam e maxima parte cellulosus; cellulæ laxæ, pressione angulatæ, minoribus succo rubro-

rosaceo effœtis paucis et præcipue peripheriam versus sitis; lacunæ plures, sparsæ. Fasciculi vasorum subnoni, versus basin stipitis irregulariter, versus apicem hujus circa centrum dispositi, sectione transversâ oblongi vel subreniformes. Dispositio fibrarum ac vasorum eadem ac in rhizomate, sed vasa majora, ductusque solubiles, pseudo-fissi compositi. Foliolorum cuticula utraque et præsertim inferior, quæ stomatosa, crassiuscula, e cellulis sinuosis globulas paucas virides minutas continentibus formata. Stomata (vel potius perforationes) maxima, sine ordine sparsa, in areolis minutis solitaria, in mediocribus plura, rotundata, inæqualia, supra cuticulam elevata, oculis nudis facile conspicienda, oris margine e cellulis linearibus 3-4 seriatis annulatim dispositis formato, membranulâ marginali simplici? late crenata. Referunt omni sensu Hepaticarum quarundam stomata. Parenchymatis cellulæ ut plurimum rotundatæ, meatibus conspicuis interceptæ; cellulis cuticulæ stomatosæ propinquis laxissimis, quam maxime difformibus et lacunis amplis interceptis. Loculorum parietes proprii tenues, membranacei, moleculis minimis crebris interspersi.

Obs. For the knowledge of this plant being a *Kaulfussia*, I am indebted to my kind friend Dr Wallich. In my M.S. I had called it *Macrostoma*, in allusion to its stomata, which, so far as I know, have been found hitherto only in the cuticulate genera of *Hepaticæ;* these organs M. Kaulfuss describes by the words "vesiculis pertusis." I have described the capsule with reference to its appearance only, but it is at once obvious that the fructification consists of as many capsules as there are cells, united together by cellular tissue, which is deficient along their inner faces, but in this species only from their middle upwards. The genus obviously belongs to the Subtribe *Marattiaceæ* or *Daneaceæ*, in which M. Kaulfuss has placed it; the correctness of this is farther pointed out by the fact, that in *Angiopteris* the evolution of the young frond takes place in a similar manner, so far at least as may be judged from the universal presence of the two scales surrounding the base of the stipes in this latter genus.

Dr Blume's species may be thus distinguished:—

K. *æsculifolia;* fronde ternata, foliolis petiolatis laterali uno alterove geminato bipartitove, stipitibus hinc canaliculatis, capsulis subnovem-locularibus, loculis per totam longitudinem dehiscentibus.

K. *æsculifolia. Bl.—Kaulfuss, in Hook. et Grev. Icon. Filicum, vol.* II. *tab.* 229.

Tab. XI. XII. *Fig.* 1. portion of the frond with stomata and sori; *f.* 2, 3. sori; *f.* 4. the same cut through vertically; *f.* 5. sporules:—*magnified.*

XXI.—SWAN RIVER PLANTS.

Among the 1300 species of plants which have been sent to us from the Swan River Settlement, by Mr James Drummond, the four following (above alluded to at p. 343, &c.,) have been selected, as deserving of being figured in this place. By G. A. W. Arnott, Esq., LL.D., &c.

[Tabs. XIII. XIV. XV. XVI.]

Myrtaceæ, Tribe Chamælaucieæ.

1. Chrysorrhöe *serrata;* foliis obovatis carnosis dorso subtriquetris ciliato-serratis mucronatis subimbricatis, pedicellis flore 2—3-plo longioribus corymbosis, bracteolis distinctis muticis deciduis, calycis glabri lobis multifidis, laciniis lineari-subulatis pectinato-pinnatipartitis, petalis oblongo-obovatis pectinatis, staminibus liberis sterilibus petaloideis oblongis integerrimis filamentis fertilibus subdimidio brevioribus, anthera globosa connectivo obtuse acuminato, stylo glaberrimo petala superante.

C. *serrata, Lindl. in Swan River Botany, p.* vi. *n.* 8.

Although Dr Lindley states in the work quoted, that a comparison of his figures of *C. nitens*, and *Verticordia insignis*, will sufficiently explain in what the difference consists between these two genera, I am rather of opinion with Endlicher, that *Chrysorrhöe* ought again to be reduced to *Verticordia*. The original character of *Chrysorrhöe*, (*Comp. Bot. Mag.* II. *p.* 357,) depended on having all the stamens free, the sterile ones subulate, the anthers roundish, apiculate,

Crysorrhoe serrata.

2-valved, and provided with two sphærical pellucid white gibbosities at the base, a naked style, and one-celled ovary composed of a single capillary leaf. But some species of *Verticordia* have the stamens free, while *V. chrysantha*, Endl., (which so far as regards the anthers and style agrees with *Chrysorrhöe*), has the stamens slightly united at the base. Besides, in *C. nitens*, the type of the genus, the two gibbosities of the anther seem to be only the prominent bases of the anther-cells: and in *C. serrata*, the whole anther forms one little globe no way different from what is observed in *Verticordia grandiflora*, and some other species. Although, however, the above characters, as well as the smoothness of the style, are certainly insufficient to distinguish *Chrysorrhöe* as a genus, the other characters derived from the ovary may perhaps prove more certain, and therefore I retain the species as placed by Dr Lindley.

TAB. XIII. *Fig.* 1. Branch; *f.* 2. Leaves, front and back view; *f.* 3. Flower-bud; *f.* 4. Expanded flower; *f.* 5. Fertile stamens, front and back view, the alternate ones shorter than the others; *f.* 6. Sterile filaments:—*magnified.*

2. Verticordia *grandiflora;* foliis carnosis lineari-triquetris mucronatis summis distiche imbricatis, pedicellis flore 2—3-plo longioribus laxe corymbosis, bracteolis ad medium connatis muticis persistentibus, calyce glabro lobis palmato-multifidis laciniis lineari-subulatis pectinato-pinnatipartitis, petalis obovatis fimbriato-multifidis glabris, staminibus liberis sterilibus complanato-subulatis trifidis nudis, antheris globosis connectivo bicorni deflexo, stylo perbrevi glaberrimo.

V. *grandiflora, Endl. Nov. Stirp. decad. p.* 69.—*V. heliantha, Lindl. in Swan River, Bot. p.* vi. *p.* 9.

We know our plant to be the same as that of Dr Lindley, and there cannot exist a doubt, we believe, of its being also that of Endlicher, although our character is slightly at variance with both descriptions. For want of a more appropriate term we have called the bracteoles persistent; but strictly

speaking they are not so, for they soon become detached from the pedicel, although from being united and as it were sheathing the pedicel, they cannot fall off till the flower itself does. Endlicher says the bracteoles are free from each other, but overlap "inferne altera exterior interiorem arcto amplexu retinens, ita ut prima fronte connatæ videantur, sed revere distinctæ, persistentes;" they appear to us truly connate so far as the middle. What Dr Lindley describes as "antheris appendice bicorni auctis," seems to be the connectivum bent down over the front of the anther and divided into two subulate segments; this structure occurs more or less conspicuously in all the species both of *Chrysorrhöe*, and *Verticordia*, although usually the deflexed horns appear to cohere with the sides of the connectivum, forming two lateral ridges, as may be seen at the apex of the anther, (*f.* 5 of our plate of *C. serrata;*) the same is exhibited in Dr Lindley's figure 3 of *C. nitens;* in his representation of *Verticordia insignis* (*fig. a*, 2), they are short and blunt.

Tab. XIV. *Fig.* 1. Leaf; *f.* 2. Flower-bud; *f.* 3. Expanded flower; *f.* 4. Fertile stamens, front and back view; *f.* 5. Sterile stamen :—*magnified.*

Lhotskya. *Schauer.*

Calycis tubus oblongus 5-costatus omnino cohærens; *limbus* patulus 5-lobus, lobis brevibus scariosis obtusis. *Petala* 5, calycis limbum longe excedentia, decidua, æstivatione imbricata. *Stamina* inæqualia, corolla breviora, numero indefinita (plura quam 10) omnia fertilia; filamenta capillaria; *antheræ* subglobosæ, dorso medio insertæ. *Stylus* filiformis, imberbis, stamina superans. *Stigma* punctiforme. *Fructus* maturus; *Pericarpium* capsulare tubo calycis arcte adnatum idemque 5-costatum. *Semen* 1 oblongum, erectum, pericarpii totam fere cavitatem implens ejusque costas intrans, hinc pariter 5-costatum; integumentum tenuissime membranaceum: *embryo* orthotropus semini conformis; *cotyledones* minimæ vix discernendæ; *Radicula* crassa, recta.

1
2
3
4
4
5

Sarotes ledifolia.

Lhotskya acutifolia

—Frutices *Australasicæ habitu* Gynothyllidi *accedentes.* Folia *conferta acerosa glabra.* Flores *sessiles, bracteolis binis persistentibus foliaceis carinatis inferne altero latere connatis in brevem pedicellam abeuntibus basi stipati. Schauer.*

3. L. *acutifolia;* foliis linearibus triquetris acutis glabris, bracteis obovatis mucronatis dorso herbaceis margine membranaceis tubo calycis brevioribus, floribus axillaribus. *Lindl. in Swan River Bot. p.* vii. *n.* 13.

Mr Drummond finds also at Swan River the original species, *L. ericoides, Sch.*, which is readily distinguished by the leaves being tetragonal, more patent, and, as well as the whole plant, more slender.

Tab. XV. *Fig.* 1. Leaves; *f.* 2. Flower; *f.* 3. Pistil and bracteas; *f.* 4. Petal:—*magnified.*

Byttneriaceæ, Tribe Lasiopetaleæ.

Sarotes. *Lindl.*

Calyx membranaceus pentagonus. *Petala* 5, cucullata. *Stamina* 5, antherarum apice elongato bilobo. *Ovarium* 5-loculare, loculis dispermis ovulis superpositis. *Stylus* supra basin scapæformis.—Folia *linearia, margine revoluta, obtusa, ramulisque incana, fasciculis pilorum nullis conspicuis, ternatim verticillata, forte stipulis in folia omnino mutatis.* Pedunculi *stellato-tomentosi, apice pauciflori corymbosi.* Flores *majusculi. Lindl.*

4. S. *ledifolia, Lindl. in Swan River Bot. p.* xix. *n.* 85.

Mr Drummond, in the collection which accompanied this memoir, distinguished three species of this genus; but as they appear only to differ in the colour of the calyx, and the greater or less breadth of the leaves, we consider them but varieties. Mr Lindley's plant has bluish flowers.

Tab. XVI. *Fig.* 1. Leaves, front and back view; *f.* 2. Flowers; *f.* 3. Flowers from which the calyx has been removed; *f.* 4. Petal; *f.* 5. Stamen; *f.* 6. Germen and style; *f.* 7. A stellate hair from the style:—*magnified.*

XXII.—*Brief Memoir of the Life of* Olaf Swartz, *with Extracts from his Letters. Accompanied by a Portrait.*

(*See the Frontispiece to Vol. II.*)

"Discessit e vita, æstimatus ab omnibus qui doctrinam in pretium habent, amatus a quocunque qui virtuti studet, desideratus ab optimo quoque et cive et extus."

Perhaps no Swedish Naturalist, save the immortal Linnæus, has enjoyed a greater degree of celebrity during life, or been more generally regretted throughout Europe, when dead, than the subject of the following short and imperfect memoir. This, however, cannot be attributed to the length of time during which Dr Swartz laboured in the cause of science, for he died comparatively young, nor yet to the number and comprehensive nature of his publications; but partly to those publications being mainly devoted to extensive tribes of plants which had previously but little engaged the attention of Botanists, such as the *Orchideæ*, the *Ferns*, and the *Mosses;* and partly to his amiable manners, his gentle and pleasing character, and above all, his generous disposition, and his readiness to communicate information with his pen, and liberally to impart the riches of his own collections for supplying the wants of younger and less opulent Naturalists. Twenty-three years have elapsed since his death, yet so far as our researches have extended, the materials to be found for his life are peculiarly meagre. Nor have we access to any thing but what may be seen in the short memoirs by Sprengel, in the 10th Volume of the "*Nova Acta Naturæ Curiosorum,*" and in some notes in the "*Conspectus Litteraturæ Botanicæ in Suecia,*" by Wikström, and what is afforded by several private letters with which he honoured us in the early part of our Botanical career, extracts from which will be here given as a specimen of his style and manner of writing.

Olaus, or Olaf Swartz, was born on the 21st September, 1760, at Nordkoping, in Sweden, a large town situated on

the river Motala in East Gothland, and which, after Stockholm, covers the greatest extent of ground of any town in the kingdom of Sweden. It is well located for trade, and is celebrated for its manufacturing establishments, one of which belonged to the father of Olaf. His mother was of noble extraction, her family name was Broberg. In 1778, he was sent to the University of Upsal, the year in which Linnæus died; but still the name and remembrance of this great man, who had raised this seat of learning to such eminence, were deeply cherished by the youths who studied there; and while Swartz was unable to share in the benefit of Linnæus's personal instructions, he caught the general ardour, and vied with those of his fellow-students who had been the immediate pupils of the illustrious Swede—an honour in those days eagerly courted or proudly claimed by all those who aspired to the character of men of science. Under the instructions of the younger Linnæus, Olaf Swartz attained great proficiency in the various branches of Natural History, as he did in medicine under the respective Professors. Throughout the summer months of the years 1779 to 1782 inclusive, he made excursions in the provinces of his native country, chiefly with the view to render himself familiar with its natural productions. He traversed the districts bounded on the west by the Gulf of Bothnia, Lapland, as far as Lulea, Finland, and lastly, the islands of Oeland and Gothland. In the twenty-third year of his age he felt an ardent desire to visit distant and especially tropical regions; and, after employing the winter in studying and arranging the collections he had already formed in his native land, and after writing his "*Dissertatio de Methodo Muscorum*," (published in *Linnæus' Amæn. Acad. v.* I. *App. p.* 69), and his history of *Gentiana pulchella*, and having communicated his inaugural treatise to the Faculty of Medicine, he quitted Sweden in 1783, passed a year in North America, and the following one landed in Jamaica. During his stay there, he applied to his University for and obtained his degree of Doctor in Medicine, and continued his travels in St Domingo, and several other of the

West Indian islands, even to the shores of South America; everywhere, besides studying the phænogamous plants, employing himself diligently in collecting Ferns, Mosses, and Lichens. At length, in 1786, he returned to Kingston in Jamaica, where, out of attachment to his native land, he declined the honour that was offered him of being appointed Botanist to his Britannic Majesty, and embarked for England on his way to Sweden. He remained for some time in London, profiting by the opportunity thus afforded him for examining the vast treasures in the Banksian Herbarium, and comparing the plants that he had himself brought home with this and other collections, and then in 1789, he returned to his own country. The Academy at Stockholm instantly enrolled him as a member, and he again made exploratory journies through various parts of the Swedish dominions, especially visiting the northern provinces, the Norwegian Alps, and part of Lapland. In 1790, Dr Swartz was nominated President of the Academy of Stockholm, and in 1791, Professor at the Bergian Agricultural Institution. About this time, he married the daughter of Dr Bergius of Upsal, but she only lived till 1797, leaving him a son and a daughter. His time was now almost exclusively devoted to Botany; the rich collections he had amassed enabling him to enter into correspondence and exchanges with the naturalists of other countries, and his innate liberality of disposition prompting him to avail himself eagerly of this ability, by which the giver and receivers were alike benefited. An honourable appointment was offered to the subject of our memoir, which became vacant on the death of Lepechin, and was pressed on his acceptance by the Academy of St Petersburgh; but this he declined, being resolved to devote his time and talents to advancing the glory of his own country. Nor was that country ungrateful. Sweden knew how to estimate such uncommon ability and rare industry. He was presented with the orders of Wasa, and of the Polar Star; in 1811, he was made Secretary of the Academy of Science, and in 1813, the duty of Professor in the Carolinian Institution was dele-

gated to him. With these accumulated honours and duties, Dr Swartz laboured in his various employments till September of the year 1818, when he died of nervous fever, after a short illness of eleven days. His constitution had never been strong, and the numerous avocations that called for his attention, were pursued with such zeal as often to make Dr Swartz neglect his health, and thus bring on attacks of illness that might perhaps have otherwise been avoided. In person he was rather above the middle height, slender, but well formed, with good features which in youth must have been very handsome, as even in later years he had all the freshness and agreeable traits of a young man. His vivacity of manners, cheerful aspect, and winning deportment, rendered him an universal favourite, while his instructive conversation and high moral character completed the fascination. A portrait of Dr Swartz, published in the Swedish Journal, is not unlike him, though it is far from doing him justice; while the medallion executed by Fogelberg, and which may be purchased in Stockholm, though highly characteristic of his features, and perfectly well done in all its parts, gives him too melancholy a countenance.

Since the days of Linnæus, no Naturalist has so much raised the fame of the Swedish school, as Dr Swartz. To him all writers on the subject appealed before committing their works to the press; and excepting Thunberg, it would be difficult to name any Botanist who imparted knowledge and distributed his treasures with such liberality, for he was above petty jealousies, and loved to see science promoted by others as well as himself. How much he aided Weber and Mohr in their publications on *Mosses*—Willdenow, Römer, and Schultes, in their more general works—Acharius in his *Lichens*—Lehmann in the *Asperifoliæ*—and Billberg, in his book on the *Botany of Sweden*, has been gratefully acknowledged by these respective authors, and scarcely a contemporary botanist exists who does not owe him valuable assistance. The writings of Swartz are marked by correctness, clear comprehension, simplicity and ease.

The beautiful family of *Orchideæ*, which has since engaged the attention of Richard, Brown, and Lindley, was first illustrated by the excellent Swartz; new Genera were formed upon certain fixed principles, figures of them were published, and many novel species added, especially West Indian ones, in the "*Genera et Species Orchidearum, systematice coordinatarum*, 1806." The Genera of Phænogamous Plants which were constituted by him are *Acidoton*, *Ardisia*, *Brosimum*, *Bumelia*, *Calyptranthes*, *Cephäelis*, *Chloranthus*, *Chloris*, *Coccosypselum*, *Corycium*, *Cranichis*, *Cymbidium*, *Dendrobium*, *Diplodium*, *Disperis*, *Ernodia*, *Epistylium*, *Hedyosmon*, *Hedwigia*, *Hoffmannia*, *Hypelate*, *Labatia*, *Lacistema*, *Legnotis*, *Leptanthes*, *Linociera*, *Lithophila*, *Meriana*, *Meyera*, *Microtea*, *Myrodia*, *Ochroma*, *Oncidium*, *Petaloma*, *Picramnia*, *Pterygodium*, *Rochefortia*, *Solandra*, *Stelis*, *Stylidium*, *Stylosanthes*, *Tanäecium*, *Thrinax*, *Tetranthus*, *Tricera*, *Trixis*, *Valentinia*, *Vanilla*, and *Wallenia*. And all these Genera were so carefully elaborated, that few indeed of them have been controverted, while the names of several are already become quite familiar to the botanist, as if founded by the *Princeps Botanicorum.*

The treasures brought by Swartz from the West Indies, after having been diligently examined and compared with specimens and descriptions of other authors, were first published in the "*Nova Genera et Species Plantarum, seu Prodromus descriptionum Vegetabilium, quæ sub itinere in Indiam occidentalem* 1783—1787, *digessit O. Swartz, Holm.* 1778;" then in his "*Observationes Botanicæ, Erlang.* 1791," and lastly, in his well-known "*Flora Indiæ Occidentalis, Vol.* 1—5, *Erlang.* 1797—1806." At different times, and in other publications, the Genera *Phyllachne*, *Forstera*, *Ehrharta*, *Stylidium*, *Linconia*, *Ochroma*, *Stylosanthes*, *Solandra*, and *Chloranthus*, were fully described and illustrated by excellent figures drawn by himself. He was author also of the designs and descriptions of many plants in the "*Svensk Botanik*," a work published, as is well known, after the model of the *English Botany;* and the 5th to the 8th volumes inclusive, which contain these, are

acknowledged to be the most accurate and valuable portion of the whole publication.

Cryptogamic Botany was particularly studied by Swartz, and the *Mosses* received a large portion of his attention. His collection of these minute but beautiful parts of the vegetable creation, which had been got together in the West Indies, is fully described in his "*Flora Indiæ Occidentalis;*" and besides the "*Methodus Muscorum,*" already alluded to, there appeared in 1799, his admirable little manual, "*Dispositio Systematica Muscorum Frondosorum Sueciæ; adjectis descriptionibus et iconibus novarum specierum,*" which has served as a model for the excellent "*Muscologiæ Hiberniæ Spicilegium,*" of Mr Dawson Turner, and for the "*Mosses of Germany,*" already alluded to, as published by Weber and Mohr. Several new Genera of Mosses were established by Swartz, such as "*Cynontodium, Conostomum, Cinclidium,* and *Calymperes;* while on the other hand certain Genera of Hedwig have been abolished; and these views have been confirmed by many recent and distinguished Botanists. *Fissidens* he combined with *Dicranum, Swartzia* with *Didymodon, Barbula* with *Tortula,* and *Webera* with *Bryum, &c.*

In no publication does Swartz's merit as a Botanist appear more conspicuous than in his "*Synopsis Filicum,*" published at Kiel in 1806, with five plates. To him we are indebted for the Genera *Lygodium, Psilotum, Botrychium, Grammitis, Anemia, Mohria* and *Cheilanthes,* and none were ever established on more solid grounds.

With respect to Swartz's labours among the Lichens, besides the several new species described in the "*Flora Indiæ Occidentalis,*" there appeared in 1811, a "*Fasciculus of the Lichenes Americanæ;*" and as to the *Fungi,* it is said by Wikström that he discovered, in the neighbourhood of Stockholm alone, three hundred species which were new to the Swedish Flora.

It is not our object to notice the numerous memoirs by our author, which were inserted in the Transactions of various Societies, whether on Botany, on Horticulture, or on Zoology.

A full list of all his works is given in Wikström's "*Conspectus Litteraturæ Botanicæ in Suecia ab antiquissimis temporibus usque ad finem anni* 1831, *p.* 244, *et seq.*

His name will be handed to posterity in the *Swartzia* of Willdenow, a genus of *Leguminous Plants* of very remarkable structure, inhabiting the West Indies and South America, to which a great number of new species have lately been added at p. 85, et seq. of our present Journal. In 1824, a medal was struck in honour of him by order of the Academy of Stockholm. It represents on one side the head of Swartz, and on the reverse, a plant of the Lily of the Valley, with the motto "honos dum prata virebunt." Sprengel has thus summed up the general character of this excellent man. "Quod Crœso scribit præceptum a Solone Herodotus, beatam vitam expectare ultimum ætatis tempus, neque quemquam, antequam e vita discesserit, dici beatum posse, id omnino in Swartzium nostrum cadere mihi videtur. Siquidem prosperitas complectitur tum earum rerum copiam, quas fortuna largitur ad bene beateque vivendum, corporis nimirum mentisque sanitatem, opulentiam etiam, seu saltem egestatis absentiam, tum ea, quæ in potestate hominum sita sunt, virtutem omnium concentum, animi candorem, scientiam amplam, suavitatem morum, tranquillitatem mentis, hominum omnium, quibuscum versamur, amorem simultatum invidiæque absentiam, domesticæ demum vitæ felicitatem et innocentiam. His omnibus cum Swartzius vel abundaverit, vel non caruerit, bene beateque vixisse exploratum habemus. Namque mediocri loco eoque honesto natus, a parentibus solerter educatus, opibus numquam indiguit ad scientiam augendam itinera suspicienda, supellectilem literariam acquirendam. Sanitate gavisus est stabili prosperaque ad ultimos usque ætatis annos. Morum suavitas et innocentia in eo ea fuit, ut amore sincero omnes fere homines amplecteretur, ut nemo ipsi invisus esset, ut a nemine læderetur, neminem unquam offenderet."

Much of the character of an individual may be learned from a perusal of his letters. We shall conclude our notice,

therefore, of this estimable Naturalist, by extracts, firstly, from one letter which was written in French, and addressed to the celebrated Muscologist, P. de Beauvois, in the possession of Mr Arnott, and then from some that were addressed to ourselves; omitting such matter as is of a private nature, or botanical remarks which could not at this period be considered novel or peculiarly interesting.

"STOCKHOLM, le 30 9.bre, 1805.

"MONSIEUR,—Reçevez mes assurances parfaites de ma sincère obligation pour vôtre intéréssante lettre du 11me. 7bre qui m'a donné un plaisir inexprimable. Vous m'avez fait un cadeau inappréciable par la participation d'un grand nombre d'espèces de Mousses, dont j'ai hazardé de vous prier me faire gracieusement une belle addition à ma collection. Je vous en donne mes remercimens de tout mon cœur, en vous assurant que rien me sera plus agreable que vous témoigner le haut prix que je mets à vôtre complaisance et amitié.

"Mon ami, Mons. Peck, Professeur d'Histoire Naturelle à Cambridge de Massachusetts en Amérique Boreale, a bien voulu, à son départ d'ici, se charger de cette lettre. J'ai aussi profité de ses offres obligeantes pour vous remettre un paquet des Mousses de mon pays, suivant l'indication que vous m'avez donné. Je me flatte que vous en trouverez quelques échantillons qui vous interessent et qui, peut-être, vous manquent encore. Je le regarde même comme une bonne fortune d'être en état de le faire, ayant voyagé pendant plusieurs années dans ce pays, par cause des recherches concernant nôtre aimable science. Ces petites choses vous serviront au moins d'extriquer des douteuses, en même tems vous pouvez être assúré de la realité des differentes espèces. Quelques unes m'ont été presque uniques; mais en general, vous trouverez des échantillons, tolerablement complets et souvent largement presentés. Je suis fâché que le tems ne me permette à present de chercher les espèces de *Hypnum* et d'autres *Cryptogames* qui peuvent me rester en double, mais

j'éspère de trouver les occasions à l'avenir de vous remettre telles une autre fois. Plait au ciel que la Paix reviendra! J'aime la France, moi, ainsi que, j'en suis sûr, la plupart de mes concitoyens. Ce n'est precisement ici, comme peut être, chez vous. Secundum B.—totus componitur orbis. Le renom de vôtre grand chef a pénétré jusque dans la Lapponie!

" Vous connaissez sans doute, M. Bory de St Vincent. J'ai été enchanté de parcourir son *Voyage aux 4 îles d'Afrique*, et j'ai reconnu chez l'Auteur le vrai savant et le plus excellent caractère. Comme c'est une vraie jouissance aux Naturalistes de se rapprocher l'un à l'autre, je vous prie, Monsieur, de lui presenter mes complimens devoués. Il m' intérésserait particulièrement de connaitre quelques unes des productions de l'Isle de Bourbon, dont M. Bory de St Vincent a fait mention. Enfin je lui serais particulièrement obligé s'il voudrait bien me regaler d'une pinnule (seulement) de ses *Calypteres*, de son *Pteris osmundioides* et *Dicksonia*, mais principalement d'une échantillon de la *Bartramia gigantea*. J'ai grande envie de connoitre cette espèce, comme j'ai decrit moi-même plusieurs espèces du même genre. Tout va bien facilement par la poste.

" Si vous avez la bonté pour moi de m' addresser quelque chose par cette voye, je vous prie de ne faire vôtre lettre plus volumineuse qu'au plus à deux onces.

" M. Afzelius est actuellement en Upsale après son retour en Suède. Je ne l'ai pas vu depuis avoir reçu votre lettre; mais je lui ai donné très recemment de vos nouvelles.

" J'ai joint à mon écrit quelques remarques que j'ai pris la liberté de faire sur vôtre ouvrage, le Prodromus, et sur les échantillons que vous m'avez envoyé. Ayez la complaisance de la regarder comme une marque de ma confiance en vos sentimens libéraux, et de mon zêle pour les vrais progrès de notre Science.

" J'ai l' honneur d'être avec une estime particulière, Monsieur,

" Votre dévoué serviteur,

" O. SWARTZ."

We think it unnecessary to quote the remarks on many genera and species of Mosses which Dr Swartz added to the above letter, simply because his views, though then novel, are now adopted by all muscologists.

"STOCKHOLM, *April* 4, 1811.

"MY DEAR FRIEND,—Pray do not consider it as a neglect from my side, to have not acknowledged your beloved letter of the 23d Sept. sooner. I did not receive your kind sendings before very lately, (15th March,) still congratulating me that I have been fortunate enough to do it at last. Accept now, dear friend, my sincerest thanks for all these proofs of your disinterested inclination towards me. I cannot express it so as I feel it. I was enchanted at the excellent parcel of the *Jungermanniæ;* nothing could be more acceptable. You can easily judge that yourself from your own experience. But how greatly I am not obliged to you for it! For the other communications of your own *Memoir on the Nepal Mosses*, as well as of the 9th Part of the *Linnæan Transactions*, so generously given away to me, I am also very much in your debt. How sorry I am not to want an opportunity of sending you a copy of the *Synopsis Filicum*, which you desire. I have requested Dr Smith to part with his, and I shall readily transmit him another again. The account of your intended trip to Adam's Peak in Ceylon,* could not but most pleasingly surprize me. May kind heaven preserve you! What *jour de fête* shall it not once be to me, to hear those consoling news, that you have saluted your Lares again! How often shall I not think of you!

"The sundry parcels from MM. Brown and Smith, which you obligingly joined to yours, I also received safe and have acquainted them both about it. I long very much to attain the pleasing moment of perusing your history of the *Jungermanniæ;* perhaps did you never see that part of *Weber's and*

* An excursion indeed once contemplated, and for which considerable preparations were made, but never carried into execution.

Mohr's Taschenbuch, which treats of the same genus. I am very vexed that I have not been able to procure me a copy of this little fine book. Mr Turner has accordingly been not more fortunate than myself, though the book is dedicated to us both. I have seen but one copy, which is kept as a treasure by the owner. Beauvois' ideas we will leave to themselves; they are neither practicable nor worth particular attention. Humboldt's works I have seen and admired, as well as I have done in respect to the surprizing botanical labours of Mr Brown. We are quite overcome by new and wonderful things, and I am sure that you are going to add to the stock in an equal manner. May health and courage be the kind concomitants of your heroic enterprize! Adieu, my dear friend. Remember me some moment in the midst of that exotical nature you intend to embrace. I am with the sincerest regard and esteem,

"Your obliged, obedient, faithful servant,

"OLAF SWARTZ."

"26me 9.bre, 1817.

"No literary communications in the world can afford me greater pleasure than yours, not so much for their being accompanied with many particular marks of your liberality, but for their interesting contents, such as your last letter of the 27th October included. Receive, my friend, my sincerest thanks for all instructions and bounty! The specimens were gratifying above description. *Weissia Templetoni* was the only one that I did not find among the rest, notwithstanding iterated researches; it may probably have been left behind.

"The *Daltonia* is certainly a very proper genus.

"A work such as you described to me on the *British Musci*, from your and Dr Taylor's hands, cannot but be most excellent and desirable. The copy you please to say is destined for me, I am ashamed to receive as a present, your having been very often too liberal against me. I certainly long for perusing such a treasure.

"Your proposal to change the plan of publishing Hum-

boldt's *Cryptogamæ* by themselves, and to incorporate them with new and rarer subjects of the same class, is most excellent, and likely to answer much better the destined purpose, that of promoting this part of the science, and I wish and hope I shall in some measure be useful to you in this undertaking, by communication of matters that perhaps deserve attention. It would somewhat satisfy me if you find the few enclosed duplicates of *Jungermanniæ* worthy notice. They appear new to me, and were these very days, given me by a friend who brought them from Guadeloupe in the course of the year. They are natives of the cloud-capped regions of that island.

"You have obliged me very much by the information about the doubtful plants in my last letter. Surprising appears to me the generic metamorphosis of *Bryum conoideum!* *Timmia Austriaca*, I believe to be distinct from *T. Megapolitana*, as I have received both from Hedwig himself. The former is an indigenous Swedish plant. The singular splachnoid moss* you mention, I long very much to see, and I wonder much that I do not find it, among many others, communicated by Dr Schmidt from Christiana, who, I think, becomes an excellent labourer in the vineyard. Yesterday I was told that he is arrived to England, coming from the Canaries. If this be true, he will certainly endeavour to see you personally, a fortune of which I am deprived. I have been hard at work on the indigenous *Roses* this summer, and am convinced of the multiplicity of that genus beyond the opinion hitherto entertained.

"Your heartily obliged friend and servant,

"OLAF SWARTZ."

"*Feb. 9th*, 1816.

"The pleasure I felt by receiving your letter of the 21st December was indeed very great, since I had been in want of all news of you very near a twelvemonth, and I began to fear that something in my last might have displeased you.

* Tayloria splachnoides, *Hook.*

Now I am satisfied it was not so, and thank you most heartily for the truly amiable and interesting contents of your letter.

"Honoured by your friendship, I should think myself undeserving, if I not offered you my best wishes for your unremitting felicity in the new connexion you have formed with the family of Mr D. Turner, on which I congratulate you from the bottom of my heart. Twenty-two years ago, I experienced a like happiness as yours, but mine was of short duration! Though nineteen years are passed, I still imprecate my bad fate, to which I should not have been reconciled, if scientifical hard pursuits had not been my consolation.

"The works of Wahlenberg, his *Flora Carpathica*, and the last of *Acharius*, I shall make my best to procure for you. A copy of my petty '*Muscologia Suecica*,' I have put aside for you. I must however say that the number of species it contains is very much increased since the time of its publication.

"Remember me with my respectful compliments to Mr Dawson Turner, and Sir James E. Smith.

"O. SWARTZ."

"*August*, 1818.

"I wish most sincerely that you have not considered me one of the most ungrateful for not having acknowledged your kind letter of April 6th, accompanied by the highly valuable present of your '*Muscologia Britannica*,' and the four numbers of the '*Musci Exotici*;' but the reason is that I have first just now handled these precious proofs of your friendship, not knowing at this moment by what means I have obtained them, on account of which I beg you to accept my sincerest thanks and assurances of my boundless obligation. I can hardly explain the satisfaction I felt at the sight of your beautiful performances, and I am sure the further perusal will afford me a vast deal of pleasure and perhaps opportunities for remarks which you permit me to communicate.

"That M. Schwägrichen has not acknowledged your letter is very singular. I know him as a very good, amiable, and attentive man. His work on the *Musci* I think very merito-

rious, though in point of artistical execution, it may stand far behind yours. You mention his *Sclotheimia* (borrowed I believe from Bridel), which has not quite satisfied me either. That it is my *Neckera torta* (*Fl. Ind. Occ.*) is true enough; the late Dr Mohr found meanwhile the particularity of this moss, which he, *expressis verbis*, speaks about in his excellent paper, you must certainly recollect as inserted in the '*Annals of Botany,*' II. *p.* 542, and figured the calyptra, capsule and peristome, in the 14th plate. He explains also (*l. c.*), the various forms of the calyptra, and the distinction between *Orthotrichum*, and his *Ulota*, from the consideration of this organ. In 1810, I likewise sent to Professor Schrader at Göttingen for his Journal, (which I supposed to be continued,) complete descriptions and figures of the *Calymperes*, and of the *Neckera torta*, whose value as a type for a genus of its own, I had myself been aware of and called it *Schizodon*, ob dentes vel cilia peristomii, nec non calyptram basi fissa. The character I formed was "Peristomium exterius; dentes 16, 2-partibiles revoluti; interius, cilia totidem 2-partita dentibus (32) opposita erecta. Calyptra campanulata basi multifida (5—8 fida.)" I described two species, the *Schizodon tortum* (*Hypnum tortum*, Prodr.—*Neckera torta*, Fl. Ind. Occ.—*Orthotrichum læve*, (not *breve*) Palis. de Beauvois Æthéog. p. 80, and *Encalypta ramosa*, var. rufescens, *Bridel.*) M. Bory de St Vincent has also found this species in the Isle de Bourbon. If you should like to have the description at large, I will send the same.

"The second species is *Schizodon acuminatum*, (the *Orthotrichum angulosum*, Palis. Æthéog.) of which I had a small specimen, but complete enough to convince me of its true affinity.

"Among several *Mosses* that I have seen, in habit somewhat similar to the above, I never observed such a form of the calyptra nor of the peristome, but they appeared to me to belong (on account of the calyptra) to the *Ulota* of Mohr; to which, according to that author's and my own observation, the *Encalypta crispata*, H., the *Grimmia parasitica*, (Encalypta, Fl. Ind.,) *Grimmia Daviesii*, *Orthotrichum coarctatum*, Palis. *O. crispum*, H. *O. curvifolium*, Wahlenb., *Weissia uncinata*,

Brid., *Neckera cirrhosa* (Fl. Ind. Occ.,) and four or five more *non descriptæ*, most from the South Seas, ought to be joined. At the hasty inspection of the exotic *Mosses*, there is, I think, something similar among them, about which more another time, as well as considering the *Hypnum Tamarisci*, (Fl. Ind.,) and the confusion of *Leskea rotulata*, etc. How much you will oblige me by some fragments of the new species, the Humboldtian, &c. Nobody can estimate their value more than I do. I dare say I may find something worth your notice for publication in my collection.

" Very lately I had the satisfaction of receiving a letter from Mr Taylor of Ireland, together with some interesting indigenous *Mosses*. But the letter was upwards of fifteen months old ! It came via Hamburgh.

" How goes it with the *Lichenographia* of Messrs Turner and Borrer, (quoted frequently in *Engl. Bot.* as in manuscript ?) I suppose nothing is published yet,* as I have not seen it announced anywhere. The tracts of M. Acharius which I send you upon the *Calicioideæ* may perhaps be of some service for extricating doubtful points on this tribe of the *Lichen* family. The accompanying Dissertation on *Daphne*, by Wikström, was delivered last year at Upsal, as a specimen *pro Grado Medico*, and I think it is a pretty good botanical publication. Besides these, you will find a little Monograph on the Genus *Diopsis*, as I know your taste for Entomology, and probably may this exhibition please you. My friend M. Schönheer has requested me to present you his best compliments; he is anxious to know if his last sending of insects and the 3d vol. of his Synonymia are come to your hands.

" Is the 2d volume of Mr Brown's *Prodromus* published at present?

" O. SWARTZ."

* This has only recently (that is in 1839,) been printed by the authors for private distribution, and is at once a proof of their deep knowledge in that branch of Botany, and a model for accurate description.

XXIII.—Cyperaceæ *a* Schomburgkio *in Guiana Anglica collectæ, ex Herbario Lindleyano. Auctore* Nees von Esenbeck.

882. Cyperus *compressus*, L.

825. C. *cuspidatus*, H. et K.

809. C. *simplex*, H. et K.

810. C. *Schomburgkianus*, N. ab E.; culmo triquetro filiformi basi folioso, foliis lineari-filiformibus obtusis culmo brevioribus, involucro triphyllo capitulum superante, spiculis ellipticis multifloris in capitulum hemisphæricum aggregatis, squamis lineari-lanceolatis sinuato-obtusatis obsolete trinervibus pallidis rufo-lineolatis, stamine uno, caryopsi lineari-oblonga trigona. ♃.

Solo C. *tenerrimo*, Presl, inter Luzuliformes affinis, sed diversus foliis brevioribus obtusis, spiculis plurifloris.

841. C. *Luzulæ*, var. *microcephalus*. (Cyp. microcephalus, *N. ab E. in Sieb. Agrostoth. n.* 103.)

806. C. *Surinamensis*, Vahl. (denticulatus, *Schrad.*)

878. C. *sphacelatus*, Vahl.

851. C. *infucatus*, Kunth.

858. Kyllingia *cruciformis*, Schrad.

971. Leptoschœnus *prolifer*, N. ab E.

Leptoschœnus.

Spiculæ distichæ, parvifloræ, squamis omnibus fertilibus, stamina 2. *Stylus* bifidus, basi continua conica brevi persistens. *Perigynium* indistinctum, 2—4-dentatum, adnatum. *Caryopsis* obovata, marginata, lævis.

Inflorescentia disticho-corymbosa, ramis elongatis simplicibus iterumve divisis, spicula media sessili. Spiculæ in radiis distantes, sessiles. Involucri foliola alterna aut subopposita. Culmi humiles, basi foliosi, foliis lineari-setaceis subtus bisulcis, supra planiusculis, margine scabris. ♃. Locus inter *Cypereas*.

1025. Hypolytrum *pungens*.

807. Non definienda species, ob flores fungositate quadam destructos.

765. Abildgaardia *Rottboelliana*, N. ab E. var. *α*.

(Absque numero) Fimbristylis *dichotoma*, W. A. et N. var. *nana*.

855. Fimbristylis *brizoides*, var. *microstachya*.

657. Isolepis *micrantha*, R. et Sch. (subsquarrosa, *Schrad.*) Isol. *Sect.* II.

804. I. *junciformis*, H. et K.; var. squamis glabris vaginis omni margine fibroso-fimbriatis.

1023. Trichelostylis *stricta*, N. ab E.; culmo compressiusculo striato stricto, umbella composita contracta, radiis 1—3-stachyis media spicula sessili lateralibus longe pedunculatis erectis, spiculis subcylindricis, squamis ovalibus obtusis glabris ferrugineis albo-marginatis, caryopsi obovato-trigona transversim punctulato-rugosa fusca, involucro diphyllo umbella multo breviori foliisque anguste linearibus canaliculatis strictis culmo multo brevioribus, margine scabris.

Trichelostylibus autumnali et *scabræ* similis.

915. Calyptrostylis *longirostris*, N. ab E.; spiculis fasciculato-capitatis axillaribus simpliciter terminalibus composite corymbosis contractis rigidis, radiis foliisque linearibus margine carinaque scabris, rostro fructu subduplo longiori.—*Calyptrostyli Rudgei* affinis. *Adnot. Cephaloschœnus articulatus, et Zeylanicus*, aptius *Calyptrostylibus* adscribuntur.

760? Holoschœnus *elatior*, N. ab E.; culmo trigono-compresso, foliis linearibus complicatis, corymbis contractis, ramis gracilibus apice di-tristachyis, spiculis pedunculatis. ♃. Ob deficientem fructum dubia restant de genere. Habitus est *Holoschœni*.

913? *Scleria stipularis*, N. ab E.; culmo triquetro, foliis culmo longioribus latis lanceolato-linearibus trinervibus nervis subtus marginibusque folii scabris, vaginis trialatis, ligula foliorum inferiorum maxima subrotunda membranacea, paniculis densis thyrsoideis rigidis e lateralibus in terminalem densam abeuntibus, spiculis distichis quadri squamibus, fœmineis solitariis ad basin ramulorum inferiorum sessilibus, masculis ternis, ramorum terminalibus omnibus masculis, fructu?

Planta speciosa, probabiliter sui generis, sed certe hujus tribus.

876. Scleria *melaleuca*, Reichenb.

860. S. *microcarpa*, N. ab E. in herb. Lindl. var. β. *longiligula;* ligula lanceolata foliorum inferiorum elongata, fructibus dimidio minoribus. An species distincta?

(Absque numero). Anogyna *tremula*, N. ab E.

ANOGYNA.

Spiculæ diclines. *Masculæ* in paniculis inferioribus laxioribus compositæ, bracteis imbricatis plurifariis; propriæ distichæ squamis 4 monandris.—*Fœmineæ* in paniculis superioribus rigidioribusque, simplices (seu potius bracteis solis residuis compositæ), unifloræ, subdistichæ. *Stylus* crassus, trifidus, coloratus. *Fructus?*

Plantæ strictæ, rigidæ, foliis habituque *Cladii. Rhizoma* horizontale crassum lignosum, fibris fuscis adscendentibus barbatum. *Culmi* crassitie pennæ anserinæ, trigoni, stricti, bipedales. *Folia* radicalia (5) e vagina brevi fusca sesquipedalia, 3 fere lineas lata, acuminata, carinata et apicem versus complicata, margine carinaque scabra, striata, rigida, coriacea, glauca: *caulina* duo breviora, distantia, vaginis fuscis totis herbaceis striatis, lobulo oppositifolio ovato. *Paniculæ* masculæ tres, bracteis foliis caulinis similibus, 2—1½-pollicaribus, vaginis suis pedunculos colligentibus, ternæ-quaternæ, patentes, decompositæ, tremulæ, ramis compressis; vagina fusca ad singulum articulum ubi pedicelli cum ramulo diviso fasciculatim nascuntur. *Spiculæ* 1—1½ lin. longæ, obovatæ obovatove-oblongæ, fusco-ferrugineæ, densæ, bracteis trifariis ovatis emarginatis cum mucrone setaceo, 5—7 nervibus. *Spiculæ* propriæ sub singula bractea 3—2—1, bracteam subæquantes, quadri-sexfloræ, oblongæ, compressæ. Squamæ distichæ, oblongæ, acutæ, carinatæ, membranaceæ, uninerves, scabræ, pallide fuscæ. *Stamen* unum sub singula squama, inferioribus abortivum, filiforme subclavatum, superiorum perfectum, filamento brevi, anthera lineari erecta, mucrone longo terminata. *Paniculæ* fœmineæ apicem versus circiter

6, decrescentes, minus ramosæ rigidulæ, contractæ, cæterum ad eundem typum formatæ. *Vaginæ* similes, at breviori acumine. *Spiculæ* adpressæ, lanceolatæ, rigidæ, virides, subdistichæ, squamis seu bracteis senis e basi ovata striata emarginata subalato-cuspidatis fastigiatis decrescentibus interioribusque submembranaceis, extrema florifera. *Spiculæ* propriæ nullæ. *Stylus* crassus, profunde tri- (subinde bi-) fidus pubescenti-hirtus, purpureus; *ovarium* cylindricum, substipitatum, scabrum. Fructum non vidi.

ANDROCOMA.* *N. ab E.*

Spicula tri-quadrifaria squamis membranaceis subenervibus persistentibus. *Stylus* trifidus, persistens. *Perigynium* nullum. *Stamina* tria. *Caryopsis* trigona, filamentis persistentibus elongatis crispatisque cum caryopsi cadentibus cincta.

Inflorescentia: *corymbus* (*in nostra specie*) *compositus.* Spiculæ *in capitula composita densissima agglomerata, paucifloræ.* Involucri *folia alterna, magna;* involucella *brevia, etiam alterna.* Capitula *bracteis membranaceis interstincta.*

Locus inter *Scirpeas plurifarias* post *Isolepidem.*

Adnot. 1. Est inter *Scirpeas* tanquam *Comostemon,* a quo non differt, nisi squamis spiculæ plurifariis.

Adnot. 2. *Comostemoni* generi subscribendum est *Androtrichum* genus Brongn., quo in numerum generum recepto cl. Kunth se ipsum correxit, nobisque, quod erat nostrum, restituit. Pertinent enim ad Genus *Comostemon* seu *Androtrichum,* Brongn., species illæ omnes, quas *Cypero* generi in antecedentibus adjungendo plantas distinctissimas male confudit. *Comostemonis* generis sunt.

1. C. *Montevidense,* (Eriophorum Montevidense, *Link. Hort. Berol.* I. *p.* 331. Androtrichum polycephalum, *Kunth.*)

Observ. Sub nomine *Cyperi Montevidensis* in hortum Vratislaviensem illata est hæc species, quam in horto Berolinensi *Eriophorum* appellavit cl. Link. *Cyperum Montevi-*

* Hoc genus inter plantas Tweedianas pertinet, post *Isolepidem* inserendum.

densem appellatum, nusquam descripsit Linkius, ut facile quis ex verbis Kunthianis p. 78 colligeret. Inter *Eriophora* quærere speciem alienissimam nefas duxi; retinui itaque nomen hortense, quo adscripto erat illatum.

2. C. *lætum* (Cyperus *lætus*, Presl.)

3. C. *impolitum* (Cyperus *impolitus*, Kunth.)

4. C. *prolixum* (Cyperus *prolixus*, H. et K. Comostemon Schottii, *N. ab E. in Linn.*)

Androcoma *speciosa* (Bonaria. *Tweedie.*) ♃.

Culmus digitum crassus. Involucrum 8-phyllum, foliis approximato-alternis corymbo duplo triplove longioribus, (exterioribus ¾ poll. latis) glaucis, carina et margine serrulato-scabris quandoque et fibroso-ciliatis. Radii 8, 8-10 poll. longi apice corymboso—3-4-radiati, corymbus centralis sessilis pluriradiolatus. Radioli 1—2 poll. longi. Involucelli foliola alterna, radiolis breviora, e basi lata setaceo-acuminata. Radioli longiores apice corymboso- aut agglomerato-radiolati. Capitula magnitudine Cerasi minoris, ovato-globosa, densissima, ex aliquot minoribus compacta, bracteolis totidem ovato-lanceolatis membranaceis interstincta. Spiculæ 2-3 lin. longæ; squamæ lanceolatæ, acutæ, carinatæ, 1—3-nerviis, membranaceæ, rufescentes, rufo-irroratæ, persistentes. Filamenta denique elongata, squama triplo longiora, crispa, rufa. Caryopsis oblonga, trigona, punctulata, fusca, in stylum trifidum persistentem continuo transiens.

1054. Xyris *involucrata*, N. ab E.; scapi ancipitis angulis foliisque lineari-ensiformibus obtusis fimbriatis, capitulo hemisphærico involucrato. ♃ Fl. flavi.

Cyperaceæ a Tweedie *in Bonaria lectæ.*

1. Cyperus *Vegetus*, *L.* var. *angustifolius.*

2. Kyllingia *obtusata*, Presl.

3. Chætocyperus *Limnocharis*, N. ab E. an nanus?—Fructus deest. Squamæ obtusæ ut in *Ch. Limnochari.*

4. Isolepis *Meyeriana*, N. ab E.

5. Androcoma *speciosa*, N. ab E. vid. supra.

6. Malacochœte *riparia*, N. ab E.

7. Scirpus *monophyllus.*

8. Eleocharis *consanguinea,* Kunth.

E. *Bonariensis,* N. ab E.; repens, culmis filiformibus striatis (subquadrangularibus,) vaginis ore albo-membranaceo mutico oblique hinc fisso, spica ovali acuta, squamis uninervibus ovalibus obtusis carina viridibus marginibus albo-hyalinis vitta laterali fusco-purpurea, infima quinquenervi viridi concolore abortiva, caryopsi pyriformi-oblonga pallida substriata tuberculo obscuriori coronata, setis hypogynis ternis. In Buenos Ayres, *Tweedie.* Hb. Lindl.

Eleocharitibus multicauli et *ochreatæ* similis, differt ab hac stigmate triplici, ab illa rhizomate crassiore, culmis profunde striatis, squamis in dorso latiori spatio viridibus, squama bracteali distincta plurinervi, vagina oblique truncata altero latere apice hiante, cet., an var.?

9. Calyptrostylis *Rudgei,* N. ab E. (Rhynchospora aurea. *Kunth, En. exclusis syn. Vahl, Brown, Nees ab Esenbeck, Rottb., Swartz, Poeppig. Exphaloschœnus divergens,* N. ab E. in Sieb. H. Martin. n. 261. et *Rhynchospora corymbifera, N. ab E.,* id est, *exclusis omnibus synonymis, ad* Rhynchosperam auream *spectantibus.*

Ad hanc, ni fallor, pertinet *Zosteræspermum gracile.* Pal. de Beauv.?

10. Nomochloa (Pleurostachys) *stricta,* Kunth. Spiculæ omnino distichæ. Ovarium in rostrum longum attenuatum.

11. Echinoschœnus *sparganioides,* var. *β.* ramis monocephalis. N. ab E.

12. Carex (Vulpina) *papillosa,* N. ab E.; spica androgyna oblonga, bracteis inferioribus foliaceis, spiculis approximatis ovatis apice masculis, stigmatibus binis, fructibus ovatis plano-convexis subimmarginatis nervoso-striatis in medio papillosis basi spongiosis squama ovata acuta paulo longioribus, rostro bidentulo.

13. Carex *Tweediana,* N. ab E.; spicis pluribus cylindricis erectis inferioribus androgynis basi plerumque compositis subexserte pedunculatis, superioribus 3—4 approximatis sessilibus totis masculis, stigmatibus ternis, squamis membra-

naceis late ovalibus cuspidato-mucronatis virescenti-hyalinis, fructu ovato ventricoso brevirostri suberoso-exasperato, bracteis omnibus foliaceis culmum superantibus, infima vaginante (foliisque) linearibus margine carinaque scabris.

Proxima *Carici hymenolepidi* et magis etiam *setigeræ*, differt autem spicis androgynis, inferioribus plerumque ad basin una alterave spica breviori quidem at similiter androgyna præditis, et fructu tuberculis parvis aspero puberuloque, nec scabro tantum.

14. Juncus *microcephalus*, *α.—β.* intermedius. An *α. et β.* species distinctæ?

15. J. *densiflorus*, H. et K.

XXIV.—*Contributions towards a* Flora *of* Van Dieman's Land, *chiefly from the Collections of* Ronald Gunn, Esq., *and the late* Mr Lawrence. By Joseph Dalton Hooker, M.D., R.N., Assistant-Surgeon and Naturalist in H.M. Discovery Ship, Erebus.

(*Continued from page* 258 *of Vol.* I.*)

Ranunculaceæ. *Juss.*

1. Clematis *blanda, Hook. in Bot. Journ. v.* i. *p.* 241, *et in Comp. Bot. Mag. v.* i. *p.* 273. *Dr Scott; Mr Lawrence* (*n.* 146, and *n.* 147); *Mr Gunn*, (*n.* 54.)

Varies in size and in the breadth of the leaves, which are generally small and glossy. Pedicels glabrous. Carpels striated, shining, red-brown, glabrous.

2. C. *gentianoides, DC.—Hook. in Bot. Journ. p.* 242.

Leaves much larger than in *C. blanda*, generally simple and entire, 3-nerved, sessile and semi-amplexicaul. Pedicels smooth, 1-flowered. Anthers aristate. Carpels dark-brown, hirsute. *Mr Lawrence* (*n.* 831); *Mr Gunn* (*n.* 53).

3. C. *aristata, DC.—Syst. Veg. v.* i. *p.* 147. *Ker in Bot. Mag. t.* 293.

* See also "*Companion to Bot. Mag.*" *v.* I. *p.* 272, where some additional species are described. The whole are enumerated in the present memoir.

Petioles and pedicels twisted or flexuose, covered with short fulvous hairs. Carpels as in *C. gentianoides.* Young leaves beautifull variegat d with dark brown, and purple beneath; as mentioned in *Comp. Bot. Mag. l. c.*, where it is conjectured to be a distinct species from *C. blanda.*

β. minor, pedicellis et petiolis minus tomentosis, floribus majoribus, foliis grosse dentatis interdum trifidis.

α. In a dense forest near Launceston. *Mr Gunn*, (*n.* 1972, and n. 773), trailing to the length of 70—100 feet.—*β.* Foot of Mount Wellington, *Mr Gunn* (*n.* 631).

1. Anemone *crassifolia* (*Hook. in Ic. Plant. t.* 257); subpilosa, foliis longe petiolatis trilobis lobis 3—5-dentatis cuneatis, involucro 2-phyllo, foliolis subsessilibus 3—5-lobis, sepalis 6 obovatis, carpellis in stylum longum ad apicem uncinatum acuminatis.

Abundant near the summit of Black-bluff mountain, at an altitude of 4000—4500 feet. *Dr Milligan* and *Mr Gunn*, (*n.* 775.)

Radix fibrosa, fibris crassis fasciculatis. *Folia* omnia radicalia, pauca, petiolata, cordata, profunde trilobata, crassa, lobis late cuneatis, profunde 3—5-dentatis. *Scapus* palmaris, pilosus, pilis brevibus appressis. *Involucrum* a flore distans, 2-phyllum, foliolis subsessilibus, trifidis, inciso-dentatis. *Flos* solitarius, majusculus. *Sepala* 6, patentia, obovata, alba, striata, glaberrima. *Stamina* 00. *Carpella* 20—30, majuscula, ovata, marginata, subsericea, in stylum subæquilongum, ad apicem uncinatum acuminatum desinentia.

Most of the specimens of this interesting and distinct species that had been gathered by Mr Gunn, were unfortunately lost. It is a very remarkable plant, as being the first described Australian *Anemone.* The leaves are singularly thick and fleshy, the involucre constantly two-leaved. Flowers like those of *A. nemorosa.* Carpels large in proportion to the size of the capitulum, and furnished with a long smooth style, uncinate at the extremity. It flowers in February.

1. Ranunculus *cuneatus. Hook. in Bot. Journ. p.* 242. *Mr Gunn* (*n.* 228.)

2. R. *inundatus, Br. in DC. Prodr. Hook. l. c. p.* 242. *Mr Gunn* (*n.* 396, and *n.* 774).

3. R. *nanus, Hook. l. c. p.* 242. *Mr Lawrence* (*n.* 324).

4. *R. lappaceus, Sm.—Hook. l. c. p.* 243. *Mr Lawrence* (*n.* 10); *Mr Gunn* (*n.* 90, and 633). *β.* vix unciam longus, pube brevi appresso vestitus.

Mr Gunn (*n.* 634). Received by Mr Gunn from Dr Milligan, who found it on the Hampshire hills. *R. lappaceus* is a most variable species as to size and the shape of the leaves.

5. R. *pimpinellifolius, Hook. l. c. p.* 243. *Mr Gunn,* (mixed with *n.* 90).—*α. glabrior;* laxe pilosus, scapis petiolisque elongatis gracilibus.—*β. vestitus;* dense pilosus, scapis petiolisque brevioribus. *Hook. Ic. Pl. t.* 260.

α. Moist places, with *R. lappaceus,* (*n.* 90.)—*β.* Abundant on the edge of a stream called Blackman's River, near Hobart Town. *Mr Gunn* (*n.* 635).

6. R. *glabrifolius, Hook. l. c. p.* 243, and *Comp. Bot. Mag. v.* i. *p.* 273. *Mr Gunn* (*n.* 157).

7. R. *leptocaulis, Hook. Bot. Journ. p.* 244, and *Comp. Bot. Mag. p.* 273. *Mr Gunn* (*n.* 229, 230, and 444).

8. R. *scapigerus, Hook. Bot. Journ. p.* 244, *Comp. Bot. Mag. p.* 270. Hampshire hills, *Mr Gunn* (*n.* 229.)

9. R. *Gunnianus, Hook. l. c. t.* cxxxiii. Western tier of mountains, altitude 4000 feet; *Mr Gunn* (*n.* 276).

DILLENIACEÆ. *DC.*

1. Pleurandra *riparia, Br. in DC. Prodr. v.* i. *p.* 72.—*α. glabriuscula, Hook. in Bot. Journ. p.* 245. *Dr Scott* and *Mr Lawrence,* (*n.* 224). *Mr Gunn,* (*nos.* 22, 32, 637, 639, 640). —*β. pubescens. Mr Lawrence,* (*n.* 225). *Mr Gunn,* (*n.* 182).

2. P. *densiflora, Hook. l. c. p.* 245. *Mr Lawrence* (*n.* 227). *Mr Gunn,* (*n.* 636).

3. P. *reticulata, Hook. l. c. p.* 245. *Mr Gunn* (*n.* 125).

4. P. *ovata, Lab.—Hook. l. c. p.* 245, and *Comp. Bot. Mag. v.* i. *p.* 278. *Mr Lawrence* (*n.* 203). *Mr Gunn* (*n.* 183). Port Arthur, *Mr Backhouse.*

5. P. *hirsuta;* foliis linearibus acutis marginibus revolutis (sed non ad costam attingentibus) sericeo-hirsutis, floribus axillaribus sessilibus solitariis, calycibus totis dense sericeis. *Hook. in Comp. Bot. Mag. l. c. Mr Gunn* (*n.* 445). Port Arthur, *Mr Backhouse.*

6. P. *acicularis, Lab. Nov. Holl. t.* 144. *DC. Prodr. v.* i. *p.* 73. Rocky Cape, *Mr Gunn,* (*n.* 641).

7. P. *astrotricha, Sieb. Pl. exsicc. Novæ Hollandiæ,* (*n.* 149). *Spreng. Syst. Veg.* iv. *p.* 191.—*P. parviflora, Sieber,* (*n.* 144). *not Br. in DC.*

Mouth of the Tamar River, and Flinders' Island in Bass' Straits, where it grew under the *Xanthorrhæas,* or *Grass-trees, Mr Gunn,* (*n.* 893).*—A dense much branched shrub, 2—3 feet high. Branches, especially their tips, hairy, upper part and revolute margins of the leaves scabrous with minute, white, callous points, under-side obscurely hispid, most so upon the nerve which is strong and sometimes excurrent. Pedicels half an inch long, and as well as the ovaries and calyces, hairy or tomentose. These specimens differ in no particular from Sieber's *P. astrotricha,* except that the flowers

* The specimens were accompanied with the following note from Mr Gunn :—

"As this was one of the few plants I was enabled to collect upon Flinders' Island, during my few hours' stay there, I cannot omit the present opportunity of expressing my hearty obligations to Sir John and Lady Franklin, who most kindly invited me to accompany them on their visit to the aboriginal establishment upon that island. Such an opportunity so seldom arrives, and encouragement to scientific pursuits has been of such rare occurrence from influential individuals in this colony, that their attention was more than usually felt. Sir John and Lady Franklin accompanied me upon foot in the evening, to see the *Grass-trees,* (*Xanthorrhœa*), distant about four miles, over a most rough and hilly road. It was quite dark before we returned, when a number of the aborigines met us with torches made of the bark, which lies in quantities upon the ground. In walking along, they picked up fresh pieces, and the light was really excellent, the effect most picturesque. The accomplished lady displayed her usual energy, walking most cheerfully over trees and bushes in a manner which astonished and delighted me. Our clothes suffered not a little from the thorny shrubs which beset our path."

are rather larger; in his *P. parviflora,* they are smaller than in either. Neither of them agrees with the *P. parviflora,* (*Br. in DC.*) which is described "*foliis subtus ramisque velutinis,*" (*v.* i. *p.* 72); nor in this particular does Sieber's *P. cinerea,* (*n.* 139), coincide with the plant of that name as described by *DC. l. c.*

1. Hibbertia *procumbens, Lab.—Hook. l. c. p.* 246. *Mr Lawrence* (*n.* 197). Circular Head and Woolnoth, *Mr Gunn* (*n.* 638). Hampshire hills, *Dr Milligan.—β. pilosa;* ramis foliisque pilosis.

Rocky Cape, *Mr Gunn* (*n.* 776). Varies much in size; the specimens from the Hampshire hills being quite as large again as those from Circular Head.

2. H. *prostrata, Hook. in Bot. Journ. p.* 246. *Mr Lawrence* (*n.* 226). In sandy soil, Epping Forest, thirty miles from Launceston, *Mr Gunn* (*n.* 642).

Carpels generally three, not single as was supposed to be the case from the imperfect specimens described in the first volume of this *Journal.* Both this and the following species have constantly twelve stamens disposed in three fascicles; 3, 4, and 5 being respectively placed opposite the union of the three carpels, their anthers opening by internal valves. Ovaries smòoth, ovules 2.

3. H. *virgata,* (*Hook. Ic. Pl. t.* 267); erecta, subramosa, subhirsuta, foliis fasciculatis anguste linearibus hirsutis seu ad apices ramorum interdum tomentosis, floribus inter folia sessilibus, 12-andris, 3-gynis.

Circular Head and Woolnoth, *Mr Gunn* (*n.* 465).—Stems erect, virgate, branches covered with the dense fascicles of leaves, hairy or tomentose at their summits. Leaves very narrow, linear, rigid, pubescent, the young ones especially so. Flowers abundantly produced, large, golden-yellow, sessile among the leaves. Sepals unequal, ovate, acuminate, downy towards the centre, with scariose margins. Petals obovate and slightly emarginate. Stamens 12; three in one fascicle being placed towards the union of two carpels, four and five respectively towards the union of the other two

carpels. Ovaries three, smooth, with long curved styles. Ovules 2.

MAGNOLIACEÆ. *DC.*

1. Tasmannia *aromatica, Br. in DC. v.* i. *p.* 78. *Mr Gunn* (*n.* 777).—"Forming a complete miniature forest, between Burghley and Mayday plains, the trees growing close together to the height of 9—12 feet. It prefers a rich soil. *Bark* when young, red. *Ripe fruit* black. Whole plant highly aromatic and pungent, whence its seeds and berries are sometimes used as pepper, and the plant is called *pepper-tree.*"

CRUCIFERÆ. *Juss.*

1. Nasturtium *semipinnatifidum, Hook. l. c. p.* 246. *Mr Gunn* (*n.* 74).

1. Barbaræa *præcox, Br. in Hort. Kev. ed.* ii. *v.* 4. *p.* 109. —*var.* foliis latioribus.

Margins of rivers, *Mr Gunn* (*n.* 643).

1. Cardamine *dictyosperma, Hook. l. c. p.* 246. *Mr Gunn* (*n.* 80, and 401).

2. C. *tenuifolia, Hook. l. c. p.* 247, and *Comp. Bot. Mag. v.* i. *p.* 273. *Mr Lawrence* (*n.* 237). *Mr Gunn* (*n.* 447).

3. C. *heterophylla;* glabra, foliis radicalibus suboblongis petiolatis, extimis cordatis integris integerrimis, reliquis pinnatisectis segmentis remotis ovato-cordatis perpaucis sinuato-dentatis terminali maximo, caulinis 1—2 pinnatifidis laciniis linearibus, corymbis paucifloris, siliquis erectis linearibus gracillimis, stigmate sessili. *Hook. Comp. Bot. Mag. v.* i. *p.* 273, and *Ic. Plant. t.* lviii.

In wet places, *Mr Gunn* (*n.* 446, and 780.)

β. minor, foliis omnibus simplicibus cordato-rotundatis integerrimis longe petiolatis, aliquis latioribus.—*an sp. distincta ?*

Shingly beach, a little above high water-mark.—*Mr Gunn* (*n.* 781).

4. C. *nivea;* glabra, foliis interrupte pinnatisectis segmentis numerosis ovatis cordatisque sinuato-dentatis basi angustatis

in rachidem decurrentibus caulinis segmentis paucioribus angustioribus supremis linearibus integris, corymbo multifloro, siliquis (immaturis) linearibus, rostro attenuato. *Hook. Comp. Bot. Mag. l. c. Mr Gunn* (*n.* 401.)

5. C. *lilacina, Hook. l. c. Mr Gunn* (*n.* 779).

Abundantly distinguished from *C. heterophylla* by the long style, more divided leaves, and very large flowers.

6. C. *intermedia* (*Hook. Ic. Pl. t.* 258); glabra, sesquipedalis, foliis subradicalibus longe petiolatis, foliolis obovato-rotundatis integerrimis petiolatis, flore mediocri albo, siliquis longe pedunculatis suberectis, stylo breviusculo.

Western mountains. *Mr Gunn* (*n.* 446?)

Erecta, laxa, glaberrima. *Folia* radicalia, longe petiolata, pinnata, foliolis 5—7 obovato-rotundatis, integerrimis, rarissime sinuato-dentatis, petiolatis. *Folia* caulina pinnatisecta, foliolis lanceolatis. Flores albi. Calyx parvus, segmentis rotundatis. Petala calyce quadruplo longiora, obovato-rotundata v. subspathulata, alba. Siliquæ lineares, 1—1¼ unc. longæ, cum pedunculo 5 lin. longo horizontali rectangulum formantes, dein erectæ. Stylus ½—¾ lin. longus, stigmate emarginato. Semina vix punctata.

1. Arabis *gigantea* (*Hook. Ic. Pl. t.* 259); elata glabra, ramosissima, foliis lato-lanceolatis ad basin contractis breviter auriculatis irregulariter dentatis subacutis, floribus parvis albidis, petalis erectis, siliquis divergentibus pedicellis 4—5-plo longioribus, stylo 1 lin. longo, seminibus brunneis clathrato-punctatis.

Black-bluff, Circular Head; growing to the height of three feet, near the sea. *Mr Gunn* (*n.* 778).

Annua, erecta, glaberrima, ramosissima, circa 3 ped. alta. *Rami* oblique adscendentes, subglauci, læves, striati. *Folia* lato-lanceolata, 4—8 unc. longa, ad basin sensim attenuata, utrinque læviter auriculata, hinc caulem semi-amplexantia, irregulariter dentata, subacuta. *Flores* parvi, albi, segmentis calycinis subellipticis acutiusculis, petalis albis subspathulatis calyce duplo longioribus. *Siliquæ* divergentes, cum caule rectangulum fere formantes, 1½ unc. longæ, pedicellis quadru-

plo longiores. *Styli* 1 lin. longi. *Semina* 10—14, mediocria, brunnea, profunde clathrato-punctata.

1. Lepidium *cuneifolium, DC. Prod. v.* i. *p.* 206.

Robbin's Island, Circular Head, and Woolnoth; growing near high water-mark. *Mr Gunn* (*n.* 645).

1. Coronopus *didyma, β. incisa, DC.—Hook. Comp. Bot. Mag. l. c. Mr Gunn* (*n.* 545).

1. Stenopetalum *incisifolium;* foliis inciso-pinnatifidis, siliquæ valvis concavis loculis 12-14-spermis. *J. D. Hook. in Ic. Pl. t.* cclxxvi.—Blackman's River on the road to Hobart Town, Van Dieman's Land. *Ronald Gunn, Esq.*, (*p.* 644.) *Fl.* Nov.

Radix annua, parva, ramosa; *Caules* plurimi ex eadem radice, suberecti, valde ramosi, graciles; fructiferi spithamei et ultra. *Folia* oblonga, inciso-pinnatifida, basi attenuata, laciniis 3-5. *Flores* ignoti. *Racemi* fructiferi elongati, digitales et ultra, gracillimi, flexuosi. *Pedicelli* erecto-patentes, semiunciam longi. *Siliqua* (fere silicula), duas lineas longa, vix lineam lata, stylo perbrevi terminata, ellipsoidea, glabra. *Valvulæ* concavæ, venosæ. *Loculi* polyspermi. *Semina* sub 13 in quoque loculo, biserialia, obovata. *Radicula* dorso incumbens.

The present plant is probably not generically distinct from *Stenopetalum*, though the valves of the siliqua are more concave than is consistent with De Candolle's character, and the seeds in each cell are more numerous, and the stigma is not sessile. These circumstances, however, together with the deeply cut leaves, will keep it specifically distinct from S. *lineare*, (Br. in De Candolle.) I have to regret that Mr Gunn did not find any flowering specimens.

VIOLARIEÆ, *DC.*

1. Viola *betonicæfolia, Sm.—Hook. in Bot. Journ. p.* 247. *Mr Lawrence*, (1831.) *Mr Gunn*, (*n.* 84.)

2. V. *hederacea, Lab.—Hook. l. c. p.* 247. *Mr Lawrence*, (1831.) *Mr Gunn*, (*n.* 95.)

3. V. *Sieberi;* caulibus stoloniferis densis, foliis fasciculatis

obovatis cuneatis seu rhombeis crenato-serratis longe petiolatis, stipulis lanceolatis subdentatis, pedunculis folio subbrevioribus. *Hook. in Comp. Bot. Mag. p.* 274.—V. *spathulata, Sieb.,* (*not Willd.*) *Mr Gunn,* (*n.* 95 ?)

1. Hymenanthera *angustifolia, Br. in DC.—Hook. Comp. Bot. Mag. p.* 274. *Mr Gunn,* (*n.* 459.)

Droseraceæ, *DC.*

1. Drosera *Arcturi, Hook. in Bot. Journ. p.* 247. *Ic. Pl. t.* 56. Summit of Mount Arthur, *Mr Gunn,* (*n.* 139.)

2. D. *peltata, Sm.—Hook. l. c. p.* 247. In wet places, *Mr Gunn,* (*n.* 784.)

3. D. *binata, Lab.—Hook. l. c. p.* 247. *Mr Lawrence,* (*n.* 144.) *Mr Gunn,* (*n.* 646.)

4. D. *lunata, Buch. in DC.—Hook. Comp. Bot. Mag. p.* 274, *and Ic. Pl. t.* liv.

The most common species here, on dry hills. *Mr Gunn,* (*n.* 350.)

5. D. *Menziesii, Buch. in DC.—Hook. in Comp. Bot. Mag. p.* 274, *and Ic. Pl. t.* liii.

A climbing plant, sticking by its leaves to the grasses, ferns, and dead wood amongst which it grows, so firmly, that it cannot be separated without much care. *Mr Gunn* (*n.* 449.)

6. D. *pygmæa, DC. Prodr. v.* I. *p.* 317.—*D. pusilla, Br. ined.* (*not Humboldt*).

Common along the coast. *Mr Gunn,* (*n.* 783.)

A very beautiful and minute species, the large stipules presenting the appearance of a silvery star surrounding the base of the scape, and scariose and laciniated, nearly equalling the petiole in length.

7. D. *spathulata, Lab. Prod. Fl. Nov. Holl. t.* 106. *fig.* 1. Abundant near Rocky Cape. *Mr Gunn,* (*n.* 782.)

Polygaleæ. *Juss.*

1. Comesperma *retusa, Lab.—Hook. in Bot. Journ. p.* 248. *Mr Lawrence,* (1831.) *Mr Gunn,* (*n.* 170.)

2. C. *volubilis, Lab.—Hook. l. c. p.* 248.

Dr Scott.—*Mr Lawrence* (*n.* 174 and 181.)—*Mr Gunn* (*n.* 147,) who says of it, "it is one of the most beautiful and common Van Dieman's Land plants."—Flowers bright blue.

3. C. *calymega, Lab.*—*Hook. Comp. Bot. Mag. p.* 274.—Port Arthur, *Mr Backhouse.*—Common in this island, varying with blue and white flowers. *Mr Gunn,* (*n.* 785.)

4. C. *ericina, DC. Prodr. v.* I. *p.* 334.

George Town, Circular Head, and Robbin's Island. *Mr Gunn* (*n.* 647).

TREMANDREÆ. *Br.*

1. Tetratheca *glandulosa, Lab.*—*Hook. Bot. Journ. p.* 248. *Mr Lawrence* (1831).—*Mr Gunn* (*n.* 194).—*α.* Leaves hairy and glandulose.—*β.* Leaves smooth, ciliated, or hairy. T. *pilosa, Lab.*—*Hook. l. c. p.* 248. *Dr Scott. Mr Lawrence* (1831). *Mr Gunn* (*nos.* 21, 193, 217, 309, 649, 786).

Of this variety, *β*, the following subvarieties may be enumerated: 1st, floribus albis, *Hook. l. c.*—2d, foliis lævissimis glabris, floribus minoribus, *Hook. l. c.*—3d, foliis latioribus marginibus vix recurvis.

From a very extensive series of specimens of this plant, sent by Mr Gunn, it appears that *T. pilosa* cannot be specifically distinguished from *T. glandulosa.* It varies extremely in the shape of the leaves, size of the plant, and in the quantity of hairs and glands. The ripe seed-vessels are constantly obovato-triangular, with a furrow on the back of each valve, 2-seeded, or by abortion 1-seeded. *Seeds* somewhat hairy, with a furrow towards the dissepiment, of a yellow brown colour. The valves are hairy, glandular, or both, corresponding with the state of the other parts of the plant. In the *T. ericina, Sm.*, which may be another variety, the capsules are generally ovate, subelliptical, and each valve is bifid at the point after the diseharge of the seeds.

2. *T. ciliata, Lindley in Major Mitchell's Australian Expedition, v.* ii. *p.* 206.—*Hook. Ic. Pl. t.* cclxviii.

West Head, mouth of the Tamar river. *Mr Gunn* (*n.* 648). *Rami* hirsuti, subglandulosi. *Folia* sparsa, opposita v. 3-4-

nata, orbiculari-rhomboidea, breviter petiolata, subobtusa, integerrima, hirsuta precipue ad margines subrevolutas, sup. virescentia, inf. pallidiora v. glauca, nervo rubro. *Flores* axillares, penduli, rosei, magni. *T. glandulosæ. Pedunculi* arcuati, setoso-glandulosi, infra calycem turbinati. *Calycis* segmenta late ovata, ciliato-glandulosa. *Petala* obovata, spathulata, marginibus præfloratione involutis. *Stamina* 8. *Ovarium* ellipticum, glandulosum. *Styli* longi. *Capsulæ* magnæ, obovato-spathulatæ.

A very distinct and beautiful species.

PITTOSPOREÆ. *Br.*

1. Billardiera *mutabilis, Lab.—Hook. Comp. Bot. Mag. p.* 275.—*B. scandens, Bot. Journ. p.* 249. *Mr Lawrence* (1831). *Mr Gunn* (*n.* 11).

2. B. *longiflora, Lab.—Hook. Bot. Journ. p.* 249. *Comp. Bot. Mag. p.* 275. *Mr Gunn* (*n.* 169, 650, 310, and 310?)

A very variable plant in the length of the leaf and size of the parts of the flower.

1. Bursaria *spinosa, Cav.—DC.—Hook. Bot. Journ. p.* 249. *Comp. Bot. Mag. p.* 275. *Dr Scott. Mr Gunn* (*n.* 15).

Beautiful specimens of this plant, now sent by Mr Gunn, prove that the var. *β. Hook.*, is a form depending upon the age of the plant. Mr Gunn says of it: "At Circular Head, it sometimes attains the height of 30—40 feet, with a trunk three feet in circumference; when young, the plant is very spinous, and the leaves almost round, but its whole aspect changes as it becomes older."

1. Pittosporum *bicolor, Hook. Bot. Journ. p.* 249. *Mr Lawrence* (1831).—*Mr Gunn* (*n.* 154, 650, and 651).

2. P. *procumbens;* pumilum, glabrum, ramis procumbentibus, foliis sparsis erecto-patentibus oblongis mucronatis lævibus marginibus revolutis, floribus terminalibus subsessilibus, petalis acuminatis rectis. *Hook. Comp. Bot. Mag. v.* i. *p.* 275. *Mr Gunn* (*n.* 151).

3. P. *nanum;* pumilum, erectum? pubescenti-scabrum, foliis

sparsis erecto-patentibus lineari-lanceolatis mucronatis marginibus revolutis, floribus terminalibus aggregatis, pedunculis flore longioribus, petalis acuminatis rectis. *Hook. l. c. p.* 275.

Hobart Town. *Mr Backhouse. Mr Gunn* (*n.* 617).

There is a plant from Van Dieman's Land found by Mr Gunn, figured and described in the "*Icones Plantarum,*" (*tab.* cclxv.), under the name of *Frankenia cymbifolia.* This, we are assured by Mr Brown himself, is his rare and little known "*Wilsonia humilis,*" which that distinguished botanist refers to *Convolvulaceæ*, under which Order we shall further notice it.

Lineæ. *DC.*

1. Linum *angustifolium, Huds.—Hook. in Bot. Journ. p.* 249. *Comp. Bot. Mag. p.* 275. *Mr Lawrence* (*n.* 154.) *Mr Gunn* (*n.* 71).

Caryophylleæ. *Juss.*

1. Spergula *apetala, Lab. Fl. Nov. Holl. t.* 182. *DC. Prodr. v.* i. *p.* 395.

Circular Head. *Mr Gunn* (*n.* 966).

Subcæspitosa, glaberrima. Radix fusiformis. Folia omnia radicalia, opposita, connato-imbricata, longa, regulariter arcuata, graminea. Pedunculi numerosi, erecti, substriati, crassi, uniflores, foliis sublongiores. Flos apetalus, 5-andrus. Calycis segmenta lanceolata acutissima, capsula ¼ longiora. Capsula ut in sequente, 1-locularis, 5-valvis.

2. S. *affinis* (*Hook. in Ic. Pl. t.* cclxvi.); cæspitosa, subacaulis, foliis subradicalibus oppositis connatis imbricatis longis flexuosis, pedunculis solitariis unifloris radicalibus arcuatis, floribus apetalis 5-andris, calycibus acuminatis, capsulis multo brevioribus.

Hampshire hills. *Mr Gunn* (*n.* 967).

Cæspitosa, glaberrima. *Radix* lignosa, cæspitosa, elongata. *Caulis* vix ullus. *Folia* radicalia arcte imbricata, opposita, connata, flexuosa, rigida, lineari-subulata, 1½ unc. longa. *Pedunculi* solitarii, foliis longiores, uniflores, arcuati.

Flos apetalus. *Calycis segmenta* ovato-acuminata, uninervia, longitudine ¾ capsulæ subæquantia. *Capsula* unilocularis, 5-valvis.

Differs from the preceding species in being more tufted, the leaves narrower and flexuose, and in the calycine segments being much shorter and less acute. In both species the capsule is 5-valved, which, with the apetalous flowers, would seem to indicate their close affinity with *Sagina*.

1. Stellaria *angustifolia*, *Hook. Bot. Journ. p.* 250.

Formosa. *Mr Lawrence* (*n.* 241). *Mr Gunn* (*n.* 238).

2. S. *pungens*, *Duperrey Voyage*, *t.* 78.—*S. squarrosa*, *Hook. l. c. p.* 250.

Common; attaining to the height of five feet by twining among the surrounding shrubs. *Mr Lawrence* (1831). *Mr Gunn* (*n.* 96).

3. S. *flaccida;* caule elongato debili ramoso nitido glabro, foliis ovato-lanceolatis acutissimis ciliatis in petiolum brevem attenuatis, pedunculis axillaribus solitariis folio triplo longioribus, petalis bipartitis, sepalis glabris uninerviis marginibus albidis longioribus. *Hook. Comp. Bot. Mag. l. c. p.* 275. *Mr Gunn* (*n.* 450, of 1835).—*β.* minus flaccida, hirsutior, petiolis brevioribus. *Mr Gunn* (*n.* 450 of 1837).

4. S. *multiflora;* glaberrima, caulibus e basi ramosissima decumbentibus, foliis sessilibus lanceolatis acutissimis basi coadunatis, pedunculis terminalibus axillaribusque (ex omni nodo) solitariis erectis foliorum longitudine, sepalis lanceolatis acuminatissimis obsolete 3-nervibus, petalis deficientibus. *Hook. Comp. Bot. Mag. t.* 275. *Mr Gunn* (*n.* 451).

5. S. *cæspitosa*, n. sp. (*Ic. Pl. ined.*)*;* glabra, opaca, cæspitosa, caulibus ramosis adscendentibus, foliis lineari-lanceolatis integerrimis sessilibus divaricatis, pedunculis axillaribus unifloris, calycibus ovato-lanceolatis subacutis, petalis profunde bifidis calyce longioribus.

In a marsh at Circular Head. *Mr Gunn* (*n.* 652 and 653?)

Stem branching, ascending, 2—4 inches long, thick. Peduncles about ½—1½ inch long, incrassated below the flower. Flowers about the size of *S. media*. Stamens 10. Styles 3.

Seeds large and tuberculated. It may be distinguished from *S. glauca* by its want of glossiness and small petals, and from *S. graminea* by its flowers not being panicled. The plants, especially the smaller ones, are very much tufted.

1. Arenaria *marina, Sm. E. Bot. t.* 958.—*A. media, L.—DC.*

By the sea-coast, Circular Head. *Mr Gunn* (*n.* 654).

1. Cerastium *vulgatum, L.—Hook. Comp. Bot. Mag. p.* 275.

An introduced plant. *Mr Gunn.*

Malvaceæ. *Br.*

1. Sida *pulchella, Bonpl.—Hook. in Bot. Journ. p.* 250.

Almost strictly diœcious. *Mr Gunn* (*n.* 173).

2. S. *Tasmannica,* (n. sp.); erecta, molliter stellato-pubescens, foliis elongato-ovatis basi subcordatis crenato-dentatis, racemis 4—8-floris axillaribus petiolo brevioribus, stylis exsertis, floribus hermaphroditis.

From Mr M'Leod's garden at Campbeltown, who received it from hills to the eastward of that township. *Mr Gunn* (*n.* 653).

Frutescens, erecta, tota pubescenti-stellata. Folia petiolata, petiolis elongatis $\frac{3}{4}$ folii æquantibus, ovato-elongata, crenato-dentata, basi subcordata, inferne pallidiora, tomentosa. Racemi axillares, breves, aggregati. Flores breviter pedicellati. Calyces stellato-pubescentes, subcampanulati, segmentis brevibus, bracteati, bracteis parvis. Petala alba, obovato-lanceolata, in tubum staminiferum unita. *Styli* 5 exserti; capsula 5-locularis, loculis monospermis stellato-hirsutis.

Nearly allied to *S. pulchella;* but the racemes are denser and bear more numerous flowers, the leaves less cordate, the calyx covered with a stellated pubescence, the styles exserted, and the plants never diœcious. The calycine segments are shorter, and the petals rounded at the extremity.

1. Lavatera *plebeja, Sims Bot. Mag. t.* 2269.—*DC. Prodr. v.* i. *p.* 439.—*β. tomentosa,* caulibus validis, pube stellata vestitis.—*L. australis, Cunn. in Hook. Herb.*

Near Woolnoth. *Mr Gunn* (*n.* 655), (also in New Holland. *Cunningham*).

This seems to be the species alluded to under *L. plebeja*, in the *Bot. Mag. l. c.* as having been collected on the south coast of New Holland. The *var. β.* differs from the described state of *L. plebeja*, in having the upper side of the leaf equally tomentose as the under side.

LAWRENCIA. *Hook.*

GEN. CHAR. LAWRENCIA. *Hook.*—*Calyx* monophyllus, subinflatus, 5-fidus, bractea trifida stipatus. *Petala* 5, lanceolata, basi coalita. *Stamina* 15—20, filamentis in tubum longum coadunatis, basi cum petalis unitis: *Antheræ* 1-loculares. *Ovaria* 5, lato-ovata, acuta, in orbem circa styli basin congesta, læviter coalita, 1-ovulata. *Stylus* 1, brevis. *Stigmata* 5, filiformia, exserta. *Carpella* unilocularia, indehiscentia, monosperma. *Semen* reniforme, suspensum. *Embryo* curvatus. *Radicula* cylindracea, ad hilum seminis versa. *Cotyledones* crassæ, inæquales, duplicatæ.—Herba *Australasica, glabra.* Radix *crassa, annua? multiceps.* Caulis *erectus, simplex, crassus, herbaceus, medullosus,* 1-*ped. ad* 3-*ped. et ultra.* Folia *stipulata, subcarnosa, ovali-spathulata, subtrinervia, obscure serrata :* radicalia *longe petiolata, summa sessilia multoties minora, arctissime imbricata, numerosissima, florifera.* Flores *parvi, sessiles, bracteati, foliis floriferis tecti et in spicam longam densam arctissime congesti.*

L. *spicata, Hook. Ic. Pl. t.* cclxi. cclxii.

HAB. Port Arthur, Van Dieman's Land, (and also at Port Fairy, South Australia), growing on the side of a salt-water inlet, where the ground was marshy. *Ronald Gunn, Esq.*

Whole plant singularly thick and fleshy, shrinking and turning black, or nearly so, in drying, so that it is difficult to determine the real nature of the different parts of the flower. The anthers, as far as can be judged, appear 1-celled; were they otherwise, this curious plant would perhaps be better referred to *Byttneriaceæ.* What we believe to be a second species of

this Genus has lately been sent by Mr James Drummond from the Swan River settlement.

BOMBACEÆ. *Kunth.*

1. Plagianthus *sidoides, Hook. in Bot. Mag. t.* 3396.—*Comp. Bot. Mag. l. c. p.* 275.—Pl. Lampenii, *Lindl. in Miscellaneous Notices to v.* xxiv. *of Bot. Register, p.* 22.—Sida discolor, *Bot. Journ. l. c.*—*Mr Gunn* (*n.* 452). *Mr Lawrence* (*n.* 227).

Mr Gunn remarks that this plant is almost strictly diœcious, and that its bark was used in the earlier times of the colony as cordage, and called *Currajong.*

BYTTNERIACEÆ. *Br.*

1. Lasiopetalum *discolor;* foliis breviter petiolatis cordatis ovatis obtusissimis supra pubescentibus subtus albo-tomentosis, ramis petiolis calycibusque ferrugineo-tomentosis, cymis parvis capitatis. *Hook. in Comp. Bot. Mag. p.* 276.—*Mr Gunn* (*n.* 551).

Leaves much broader than in the following species, and white underneath.

2. L. *dasyphyllum, Sieber, Pl. exsicc. Novæ Hollandiæ* (*n.* 240).

Var. β. foliis minoribus, plerumque valde obtusis minusque cordatis, superne ferrugineo-virescentibus, inferne argenteo-tomentosis, præsertim ad nervos punctis stellatis rubris notatis, petiolis foliisque junioribus rubro-tomentosis, fasciculis florum multo minoribus.

Mr Gunn (*n.* 551), (1837).—First discovered by *Mr Backhouse* at the base of two hills called "*the Sisters,*" between Rocky Cape and Table Cape. It grows there amongst dwarf *Banksias.* It was sent by *Mr Gunn* as the *L. discolor,* Hook., but is a very different species, and apparently the *L. dasyphyllum,* Sieber; the leaves in his and our specimens vary much. The *var. α.* has been received from King George's Sound, collected by Mr Baxter. It may be the *L. rubiginosum* of Mr Cunningham, in *Field's Voyage, p.* 344.

Elæocarpeæ. *Juss.*

1. Friesia *peduncularis, DC.—Hook. l. c. p.* 250.—*Mr Lawrence* (*n.* 200, and 302). *Mr Gunn* (*n.* 312.)

Hypericineæ. *DC.*

1. Hypericum *involutum, Chois.—Hook. l. c. p.* 251.—*Mr Lawrence* (*n.* 210). *Mr Gunn* (*n.* 73).

2. H. *pusillum, Chois.—Hook. l. c. p.* 251.—*Mr Lawrence* (*n.* 149). *Mr Gunn* (*n.* 656).

3. Carpodontus *lucida, Lab.—Hook. l. c. p.* 251.—*Mr Lawrence* (*n.* 80). *Mr Gunn* (*n.* 272).

Sapindaceæ. *Juss.*

1. Dodonæa *aspleniifolia, Rudge.—DC.—Hook. l. c. p.* 251. *var. β. arborescens.—Mr Lawrence* (*n.* 221). *Mr Gunn* (*n.* 377).

2. D. *salsolifolia,* (*Cunn. Mss.*) *Hook. l. c. p.* 351.—*Mr Lawrence* (*n.* 321.) *Mr Gunn.*

Geraniaceæ. *DC.*

1. Erodium *cicutarium, L.—Mr Gunn* (*n.* 660.)—Introduced?

1. Geranium *potentilloides, L'Hérit—Hook. l. c. p.* 252. *Mr Gunn* (*n.* 259.)

2. G. *parviflorum, Willd.—Hook. l. c. p.* 252.—*Dr Scott. Mr Gunn* (*n.* 63 *and* 453.)

3. G. *brevicaule, Hook. Bot. Journ. l. c. p.* 252.—*Mr Gunn* (*n.* 256 *and* 324.)

4. G. *pilosum, Forst. Prod. n.* 531. *Sweet, Geran. t.* 119. *DC. Prod. v.* i. *p.* 642.

Circular Head, *Mr Gunn* (*n.* 789.) In this species the hairs are remarkably reflexed.

1. Pelargonium *australe, Willd.—Hook. l. c. p.* 252.—*Dr Scott. Mr Gunn* (*n.* 659 *and* 425.)—*β.* minus, *Cunn.—Mr Gunn* (*n.* 61.)—*γ. albiflorum, Hook. l. c.—Mr Gunn,* (*sub n.*

425.)—δ. *glabriusculum, Hook. l. c.—Dr Scott. Mr Gunn* (*n.* 657 *and* 648.)

A most variable plant in every respect, even in the situation of the nectary, which renders the species *P. erodioides* (*Hook.*) a doubtful one. The following numbers of Mr Gunn belong to this plant or states of it. (*n.* 61, 61? 62, and 425, 657, 658, 787, 788.)

2. P. *erodioides, Hook. l. c. p.* 252. *Mr Gunn* (*n.* 352.)—An species distincta?

Oxalideæ. *DC.*

1. Oxalis *microphylla, Poir.—DC.—Hook. l. c. p.* 253. *Dr Scott, Mr Lawrence* (*n.* 231.) *Mr Gunn* (*n.* 94, 370.)

2. O. *lactea;* acaulis, parce pilosa, foliis longe petiolatis ternatis, foliolis obcordatis utrinque lævibus, scapo petiolis sublongiore supra medium bibracteolato unifloro, flore erecto. *Hook. in Comp. Bot. Mag. l. c. p.* 276. *Mr Gunn* (*n.* 370.)

Zygophylleæ. *Br.*

1. Zygophyllum *Billardieri, DC.—Hook. l. c. p.* 276.

Flinders' Island in Bass' Straits. *Mr Backhouse. Mr Gunn* (*n.* 552.)

Rutaceæ, *Juss. DC.*

1. Corræa *alba, Andr.—Hook. in. Bot. Journ. l. c. p.* 253.

Mr Lawrence (1831.) *Mr Gunn* (*n.* 428,) who says of it, "It is the only Van Dieman's Land species with erect flowers. It grows along the coast, forming a shrub 2-3 feet high."

2. C. *virens, Sm.—Hook. Bot. Journ. p.* 253, *and Comp. Bot. Mag. p.* 276.

Mr Lawrence (1831.)—Hobart Town and George Town, generally growing prostrate, *Mr Gunn* (*n.* 152.)

3. C. *Backhousiana, Hook. Bot. Journ. p.* 253, *and Comp. Bot. Mag. p.* 276, *and Ic. Pl. t.* ii.

Cape Grim, *Mr Backhouse.*—Woolnoth and Robbin's Island, *Mr Gunn* (*n.* 456.). Grows to the height of four feet. A

variety of this, with punctate leaves, was found at Hobart Town by *Mr Cunningham*, also at M'Quarrie harbour.

4. C. *Lawrenciana, Hook. in Bot. Journ. l. c.* An erect shrub of from 8-10 feet high, *Mr Lawrence* (*n.* 151). *Mr Gunn* (*n.* 453).

5. C. *ferruginea* (*Gunn mst.*); foliis erectis (?) ovali-lanceolatis obtusissimis in petiolum attenuatis integerrimis supra viridibus glaberrimis lævibus impresso-punctatis subtus stellato-tomentosis ferrugineis, floribus 1-3 terminalibus cylindraceis pendulis, dentibus calycinis acutis, staminibus longe exsertis. *Hook. in Comp. Bot. Mag. p.* 276, *and Hook. Ic. Pl. t.* iii.

Mr Gunn (*n.* 457 and 457 ?) An inland straggling shrub, growing from 3-9 feet high on mount Wellington at 1500 feet of elevation. On the banks of the M'Quarrie river 60 miles from the sea. *Dr Milligan.*

6. C. *speciosa, Andr. Bot. Rep. t.* 653.—*DC. Prod. v.* i. *p.* 719.—α. foliis ovato-oblongis valde tomentosis, floribusque rubris suberectis. New Holland, *Messrs Fraser and Cunningham.*—β. foliis ovatis v. ovato-cordatis cum floribus pendulis minus tomentosis. New Holland, *Sieber* (*n.* 239.)—Van Dieman's Land, *Mr Gunn,* (*n.* 663.) Grows between George Town and the sea, procumbent, 1 foot high with long shoots. —δ. minus tomentosa, foliis ovato-cordatis cum floribus luteis pendulis. Found with the *var.* β. *Mr Gunn,* (*n.* 664.)

1. Eriostemon *verrucosus, A. Richard, Voyage de l'Astrolabe t.* 26.—*E. obcordatus, Hook. l. c. p.* 254, *and Cunn. Mss. and Ic. Pl. t.* lx.

Hobart Town, *Cunningham.*—*Mr Lawrence,* (1833.) (*n.* 153).—*Mr Gunn,* (*n.* 14.)

2. E. ? *trinervis, Hook. l. c. p.* 254.

Mr Lawrence (*n.* 91 ? 1831.)

3. E. *virgatus* (*n. sp.*); erectus, sub-ramosus, glaber, foliis elongato-obovatis mucronatis inferne et marginibus minute tuberculatis sessilibus, floribus axillaribus, calyce 4-sepalo, petalis 4, staminibus 8 ciliatis, carpellis 4.

Rocky Cape, *Mr Gunn* (*n.* 485, 1837.)—New Holland, *Mr Cunningham.*

Erectus, glaberrimus, frutescens. Rami teretes, rubri, tuberculati, elongati. Folia alterna, copiosa, obovato-lanceolata, sessilia, $\frac{1}{2}$ unc. longa, superne subnitida, ad margines præcipue tuberculata, inferne glanduloso-punctata, nervo valido excurrente. Flores breviter pedicellati, pedicellis ad basin bituberculatis v. bibracteolatis, axillares, plerumque solitarii, rosei, segmentis calycinis 4 brevibus obtusis, petalis 4, pedicello longioribus. Stamina 8, filamentis latis compressis ciliatis, antheris intus dehiscentibus. Ovarium 4-loculare; stylo simplici; stigmate capitato.

Differs from any described species, and from the genus in the constantly quaternary arrangement of the parts of the flower.

1. Phebalium *retusum, Hook. l. c. p.* 254. *Ic. Pl. t.* 57. *Dr Scott. Mr Lawrence* (1831.) *Mr Gunn* (*n.* 455.)

2. P. *montanum, Hook. l. c. p.* 255. *Ic. Pl. t.* 59. *Mr Lawrence,* (*n.* 321). Western mountains, Elev. 3500 feet. *Mr Gunn* (*n.* 223.)

3. P. *Billardierii, Adr. Juss.—Hook. Comp. Mag. p.* 277. *Mr Gunn* (*n.* 545.)—Grows from 6-15 feet high.

1. Boronia *tetrathecoides, Pers.—Hook. Comp. Bot. Mag. p.* 277.

2. B. *hyssopifolia, Sieb.* (*n.* 296). *Hook. Bot. Journ. p.* 255. *Mr Lawrence,* (1831.) *Mr Gunn* (*n.* 458, 1832.) Stamens always hairy.

3. B. *variabilis, Hook. Comp. Bot. Mag. p.* 277. *Mr Gunn,* (*nos.* 214, 666, 667.) (*not* 667 of 1837.)

Varies with regard to the quantity of tubercles and glandular dots upon the leaves. It is the only species with broad, obtuse, obcordate or spathulate leaflets, often trifid at the extremity or bipinnate. Flowers abundantly produced, large, pink. "It is the *Lemon-plant* of the colonists, and grows upon hills, at 4000 feet of elevation, to the height of 18 inches. The rougher and more glandular varieties are found at a less elevation, and are from 2-3 feet high, and smell like *Mango.*"—*Gunn.*

4. B. *tetrandra, Lab. t.* 125.—*DC. l. c.* sed floribus semper 8-andris. *Hook. Comp. Bot. Mag. l. c.,* and *B. variabilis,* α. and γ, *Hook. Bot. Journ. l. c.*

The following are my ideas of the varieties of this protean species, deduced from the comparison of a numerous suite of specimens sent by Mr Gunn. All are octandrous.

α. floribunda; foliis linearibus petiolatis 3—4-jugis, ramis hirsutis, floribus pernumerosis lateralibus et terminalibus.—Agrees best with Labillardière's figure. *Mr Gunn* (*n.* 665).

β. terminiflora; foliis linearibus petiolatis, ramis hirsutis, floribus semper terminalibus fasciculatis.—Leaves broader than in *α.* Plant more erect. *Mr Gunn* (*n.* 790).

γ. grandiflora; foliis majusculis longioribus ovato-lanceolatis sub-2-jugis, floribus axillaribus maximis, ramis fere glabris. Launceston. *Mr Gunn* (*n.* 8). Smells like Tansy or Rue.

δ. laricifolia; strictâ, virgata, subramosa, foliis in fasciculis distantibus 2—4-jugis, petiolis subnullis sæpe arcte ramo appressis, floribus omnibus terminalibus fasciculatis minoribus. Circular Head, &c., *Mr Gunn* (*n.* 790).

ε. pilosa.—B. pilosa, Lab. DC.—Hook. Bot. Journ. p. 255. Scarcely differs from *var. β. Mr Lawrence* (1831). *Mr Gunn* (*n.* 151, 667).

5. B. *nana* (n. sp.); parva, erecta, caule puberulo, foliis oppositis impari-pinnatis, foliolis 3 sessilibus elliptico-lanceolatis acutis glandulosis glabris, floribus in axillis foliorum sessilibus pedunculatis. *Hook. Ic. Pl. t.* cclxx. Rocky Cape. *Mr Gunn* (*n.* 894).

Radix lignosa. *Caulis* subnullus. *Rami* erecti v. adscendentes, puberuli, 5—6 unc. alti. *Folia* erecta, glabra, opposita, breviter petiolata, 4—5 lin. longa, impari-pinnata, foliolis 3 sessilibus, ellipticis, lanceolatis, acutis, punctato-glandulosis. *Flores* rosei, pedunculati. *Pedunculi* solitarii, ex axillis foliorum et eos longitudine æquantes, uniflores. *Calyx* 4-sepalus, sepalis ovatis acuminatis. *Corolla* calyce duplo longior, rosea, 4-petala, petalis obtusis. *Stamina* 8, filamentis pilosis. *Ovarium* 4-partitum. *Carpella* abortu 2. *Stylus* brevis subhirsutus.

1. Zieria *arborescens, Sims.—Hook. Bot. Journ. p.* 256. *Mr Lawrence* (1831), (*n.* 152). *Mr Gunn* (*n.* 140).

Rhamneæ. *Br.*

1. Discaria *australis, Hook. Bot. Miscell. v.* i. *p.* 157. *Bot. Journ. v.* i. *p.* 256. *G. Donn, System of Gardening, v.* ii. *p.* 35.—*Tetraspora juncea, Donn, ibid. p.* 40. *Mr Gunn* (*n.* 206).

1. Pomaderris *apetala, Hook. Bot. Journ. p.* 256. *Mr Lawrence* (1831). *Mr Gunn* (*n.* 126).

2. P. *racemosa, Hook. l. c. p.* 256, *and Comp. Bot. Mag. p.* 277. *Mr Lawrence* (*n.* 143). *Mr Gunn* (*n.* 461).

3. P. *elliptica, Lab.—Hook. Bot. Journ. p.* 256. *Mr Lawrence* (*n.* 186, 1831). *Mr Gunn* (*n.* 440).

4. P. *parvifolia, Hook. l. c. p.* 257. *Mr Lawrence* (*n.* 95, 1831).

5. P. *ericifolia, Hook. l. c. Mr Gunn* (*n.* 231).

6. P. *obovata;* foliis obovatis retusis integerrimis marginibus revolutis supra nudis subtus albo-fuscescenti-lanatis, floribus glomerato-capitatis sessilibus bracteatis terminalibus foliosis, petalis cucullatis patentibus. *Hook. in Comp. Bot. Mag. p.* 277. *Mr Gunn* (*n.* 460.)—Discovered by *Mr Backhouse* at Meredith River, Swan Port, East coast.

1. Cryptandra *ulicina, Hook. Bot. Journ. p.* 257. *Mr Gunn* (*n.* 150). *Mr Lawrence* (*n.* 233).

2. C. *vexillifera, Hook. l. c. p.* 257. Port Dalrymple. *Mr Fraser. Dr Scott. Mr Lawrence* (*n.* 185). *Mr Gunn* (*n.* 16, and 792, 1837).

3. C. *amara, Sm.—Hook. l. c. p.* 258. *Mr Lawrence* (*n.* 160, 1831).

Stackhousieæ. *Br.*

1. Stackhousia *monogyna, Lab.—Hook. Bot. Journ. p.* 258. *Dr Scott. Mr Lawrence* (*n.* 106, 1831). *Mr Gunn* (*n.* 69, and 462.)

I cannot but consider the *S. obtusa* of Dr Lindley (*Bot. Reg. sub tab.* 1917), as a form of *S. monogyna,* which in Mr Gunn's specimens varies very much in the length of its bracteas and spike; it is the *n.* 469, of the collection.

2. S. *maculata* (*Sieb. Fl. Nov. Holl. exsicc.*); foliis obovatis sessilibus integris ad apicem rotundatis, junioribus acutis, spicis brevibus interdum inter folia sessilibus, floribus mediocribus densis, corollæ segmentis obtusis.

Barren Island, one of the Hunter's Islands. *Mr Gunn* (*n.* 895). Port Jackson. *Mr Cunningham. Mr. Fraser.*

Erecta, glabra, e radice ramosa. *Radix* valida. *Rami* plurimi, erecti, simplices, striati, 1—2 ped. longi. *Folia* numerosa, suberecta, interdum subimbricata, obovata, sessilia, uninervia, integra, ad apices rotundata, junioribus acutis v. apiculatis marginibus cartilagineis, pallide virescentia, maculis pallide rubris notata, $\frac{3}{4}$—$1\frac{1}{2}$ unc. longa. *Spicæ* terminales, breves, subacuminatæ, interdum inter folia subsessiles. *Bracteæ* tubum corollæ subæquantes. *Flores* aggregati.

3. S. *flava*; parva, foliis linearibus v. lineari-lanceolatis curvatis apicibus subrecurvis interdum subsecundis, spicis parvis terminalibus nudis, floribus subcapitatis horizontalibus v. pendulis pedicellatis, corollæ segmentis acutis. *Hook. Ic. Pl. t.* cclxix.

Near Woolnoth. *Mr Gunn* (*n.* 793).

Radix lignosa, fusiformis. *Caulis* brevis. *Rami* plurimi, adscendentes, striati, $\frac{1}{2}$—$\frac{3}{4}$ ped. alti. *Folia* parva, laxa, glabra, subsecunda, curvata, lineari-lanceolata, apicibus acutis subrecurvis, marginibus integris, tenui-cartilagineis, 7—9 lin. longa, pallide virescentia. *Spicæ* e foliis remotæ, subcapitatæ, obtusæ, flavo-virescentes. *Bracteæ* 3—5, minimæ. *Flores* horizontales, v. reflexi, breviter pedicellati. Segmenta calycina brevia, acuta. *Corollæ* limbus acutus tubo brevior. *Antheræ* staminum 3 longiorum exsertæ. *Carpella* et *stigmata* 2—3.

(*To be continued.*)

XXV.—*Description of a New Species of* Crescentia; *with Observations on the affinities of the Genus.* By George Gardner.

In the garden of the "Vigario Geral," and afterwards in others at the Villa da Natividade, in the north of the pro-

vince of Goyaz, I have found in cultivation a species of *Crescentia* which does not accord with any of the seven species of that genus described in Sprengel's edition of the "*Systema Vegetabilium*," and which may be distinguished from them all in the following manner:—

CRESCENTIA. *Linn.*

C. *cuneifolia;* arborea, foliis confertis obovatis abrupte et breviter acuminatis versus basin longe cuneatis superne glabris nitidis subtus nervo venisque puberulis, fructibus globosis.

HAB. in Brasiliæ Prov. Goyaz, apud Natividade in hortis culta.

Description.—A much branched *tree*, about eighteen feet high. Principal *branches* nearly vertical, the smaller ones horizontal. *Bark* thick, soft, much cracked longitudinally, and of a greyish colour. *Leaves* in fascicles of from 2—8, arising from the centre of large flattish nodes. Abortive branchlets covered by thick broken laminæ of soft bark, and petioles surrounded by a few small withered subulate scales; *petioles* about three lines long, somewhat winged by the decurrent base of the leaf; entire leaf from 4—7 inches long, and from 1½—2½ inches broad, obovate, abruptly and shortly acuminate, towards the base greatly cuneate, glabrous and shining above, and of a dark green colour, beneath slightly pubescent, particularly on the prominent midrib and large veins, opaque, and paler than above. *Flowers* solitary or in pairs, springing from nodes similar to those from whence the leaves arise; but always destitute of leaves, principally on the thicker branches, and often on the trunk itself, pedicellate; *pedicel* about an inch long, bearing three small scariose bracts a little below its middle. *Calyx* inferior, monadelphous, deciduous; in its early state forming an ovate oblong shut sac which encloses the internal parts of the flower, ultimately splitting almost to the base into two, rarely into three, nearly equal ovate divisions. These divisions, however, have no certain relation to the axis of inflo-

rescence, sometimes being lateral, and sometimes anterior and posterior. *Corolla* inferior, monopetalous, campanulate, taking its rise from between the base of the calyx and a disk which surrounds the base of the ovary, lower side of the tube doubled in transversely about the middle; limb subbilabiate, upper lip 2-lobed, lower 3-lobed, lobes much acuminated and irregularly lacinated, the middle one of the lower lip broader than the others, the upper ones nearly plane, the lower one plicate longitudinally, structure fleshy, the outside thickly covered with minute pellucid glands, colour greenish yellow, with the reticulated veins of the lobes purplish; æstivation imbricate. *Stamens* 4, didynamous, with the rudiment of a fifth between the two posterior ones, arising at nearly equal distances from each other near the bottom of the corolla, included; *filaments* thick, all nearly of the same length, but the anterior ones appear shorter by separating from the corolla a little further down than the posterior ones; *anthers* 2-lobed, attached to the filament by their upper end, divergent below, lobes one-celled, cells bursting inwards longitudinally. *Pollen* globose, white. *Ovary* superior, oblong, seated within a yellow annular disk, 1-celled, with four fleshy parietal polyspermous placentæ, placed one on each half of the pericarpal leaves, and at equal distances from each other. *Ovules* horizontal; *style* 1, about the length of the stamens, flattened towards the top; *stigma* formed of two broad plates. *Fruit* a large perfectly globose, smooth, green *berry*, from 6—8 inches in diameter, bearing on its top the scar of the deciduous *style*, and on its bottom the annular disk; *pericarp* woody, consisting of two indehiscent carpels, placed anterior and posterior to the axis of the inflorescence. *Pulp* fleshy, formed by the increase and union of the placentæ, in which the seeds ultimately nidulate irregularly. *Seeds* roundish, flattened; *testa* coriaceous, loose; *albumen* none; *embryo* erect; *cotyledons* 2, thick, orbicular, emarginate, and cordate at the base; *radicle* next the hilum, thick, short, and but little protruded beyond the cotyledons.

Observations.—Whether or not this species of *Crescentia*

may ultimately prove to be distinct from those which are already described, it has at least afforded me an opportunity of minutely examining its structure; and, as the genus has not yet received a fixed "local habitation" in the Natural System, I may be allowed to make a few observations on its affinities. Notwithstanding that the fruit is fleshy and indehiscent, if the pulp and seeds are scooped out of it when ripe, the internal surface of the pericarp presents the following appearance:—A well marked suture is seen dividing it into two portions which stand anterior and posterior to the axis of inflorescence, while another which is less distinctly marked, crosses this, and is no doubt the midrib of the pericarpal leaves. This structure at once refers the genus to the dicarpose group of Dr Lindley's monopetalous plants, and its unimbricated calyx, unsymmetrical flowers, and exalbuminous seeds, unattached to placental hooks, place it in the Bignonial alliance of that group; and it is consequently with the Orders contained in it that *Crescentia* has the most numerous resemblances. The Orders of this alliance are *Pedaliaceæ*, *Bignoniaceæ*, and *Cyrtandraceæ;* and it is in *Bignoniaceæ* that Dr Lindley has placed, apparently provisionally, *Crescentia;* but it seems to be very different from the normal genera of that Order, in its 1-celled ovary, four parietal placentæ, fleshy indehiscent fruit, and wingless seeds. It differs also in the anomalous structure of its calyx, although that of *Spathodea* is somewhat analogous; and the didynamous character of *Crescentia* differs very materially from that of *Bignoniaceæ*, the posterior pair of stamens in the former being the longest, while in the latter, the anterior pair are longer than the posterior. With *Bignoniaceæ* it agrees in habit, and approaches it somewhat further through *Eccremocarpus*, which has a 1-celled fruit, and parietal placentæ.

In the economy of its fruit, *Crescentia* is more closely related to *Cyrtandraceæ* than to *Bignoniaceæ*, but differs essentially from it in the structure of its calyx, in its four distinct placentæ, horizontal, not suspended ovules, and particularly in habit. The same observations apply to *Pedali-*

aceæ, which are also 1-celled, for although the ripe fruit of both them and *Cyrtandraceæ*, possess apparently more than one cell, as if produced by the spreading and dividing of their parietal placentæ; the ovary of both, according to Bentham, being always unilocular if examined before the development occasioned by fecundation.

To all the other orders of the dicarpose group, *Crescentia* is of course more or less related, but is abundantly distinct from every one. Thus, it is distinguished from *Acanthaceæ* by its simple calyx, 1-celled ovary, unsuspended seeds, and in habit; from *Lentibularieæ*, by its parietal not free central placentation; and from *Scrophulariaceæ* and *Solanaceæ* and their allies, by its want of albumen.

While it is evident that it is to the Bignonial alliance that *Crescentia* belongs, it appears equally obvious to me that it cannot be joined to any of the Orders in it, without materially weakening their characters. Lindley remarks (*Nat. Syst. ed.* ii. 282), that "there do not appear to be any very certain limits between *Bignoniaceæ*, *Cyrtandraceæ* and *Pedaliaceæ*, which might be reunited without much inconvenience," and this observation is no doubt true; but while these Orders are allowed to remain separate, I see no reason why *Crescentia* should not also form a separate order, it being as distinct from them as they are from each other. I therefore propose that the genus *Crescentia* should form the type of an Order to hold an intermediate station between *Bignoniaceæ* and *Cyrtandraceæ*, with the following character; but as this character has been drawn up from the examination of a single species only, it will no doubt require to be much modified.

CRESCENTIACEÆ. *Gardner*.

Calyx inferior, monosepalous, at first perfectly entire, and forming a shut sac around the corolla and genitals, ultimately splitting nearly to the base into two, rarely three, somewhat equal divisions. *Corolla* hypogynous, monopetalous, campanulate, irregular, somewhat 2-lipped, the lobes imbricate in æstivation. *Stamens* 4, didynamous, with the rudiment

of a fifth between the posterior pair, which are the longest. *Anthers* 2-lobed, lobes 1-celled, bursting inwards longitudinally. *Pollen* globose, white. *Ovary* superior, seated in a yellow annular disk, 1-celled, with four fleshy, parietal, polyspermous placentæ. *Ovules* horizontal. *Style* 1. *Stigma* of 2 plates. *Fruit* a large 1-celled berry, with a woody pericarp consisting of two indehiscent carpels. *Pulp* fleshy, formed by the increase and union of the placentæ in which the seeds ultimately nidulate irregularly. *Seeds* roundish, flattened. *Testa* coriaceous, loose. *Albumen* none. *Embryo* straight. *Cotyledons* thick, roundish, cordate. *Radicle* next the hilum, thick, short.—*Trees* of intertropical America. *Leaves* alternate or clustered, exstipulate. *Flowers* solitary or in pairs, taking their rise from nodes on the stems and branches.

VILLA DE NATIVIDADE, PROVINCE OF GOYAZ,
BRAZIL, *December*, 1839.

XXVI.—*Description of a New Phosphorescent Species of* AGARICUS. By MR GEORGE GARDNER ; *with remarks upon it by the* REV. M. J. BERKELEY.

ONE dark night about the beginning of the present month, December, while passing along the streets of the Villa de Natividade, I observed some boys amusing themselves with some luminous object, which I at first supposed to be a kind of large fire-fly ; but on making inquiry I found it to be a beautiful phosphorescent species of *Agaricus*, and was told that it grew abundantly in the neighbourhood on the decaying fronds of a dwarf palm. Next day having procured better specimens, I was enabled to make the accompanying rude figure, which, however, is quite characteristic of its appearance, and the following description. It belongs to the section *Pleurotus* of Fries, but does not agree with any of the species of that tribe described by Sprengel. If new, I propose to name and characterize it as follows :—*Agaricus phosphorescens*,—(a name for which Mr Berkeley thinks the following ought to be substituted,)

A. *Gardneri* (Berk. mst.); pileo carnoso-coriaceo subindifundibuliformi glabro flavo, lamellis longe decurrentibus pallidioribus, stipite brevi coriaceo glabro cinerascente.

Hab. in Brazilia, ad folia palmarum quæ ab incolis dicantur *Pindoba.*

Description.—Plant growing solitary, or two or three together on the bases of the half-rotten midribs of the fronds of a stemless palm called *Pindoba* by the Brazilians. *Pileus* about 2½ inches broad, depressed, at length becoming somewhat infundibuliform, margin waved and lobed, texture between coriaceous and fleshy, glabrous, and of a beautiful lemon-yellow colour. *Gills* rather distant, decurrent, various, between every two which reach to the top of the stipes are from three to seven shorter ones, varying from two lines to nearly an inch in length, the lower end of the shorter ones roundish, the long ones gradually becoming narrower till they finally merge into the stipes, of a paler colour than the pileus. *Stipes* excentric, solid, about an inch long, and half an inch thick, of a more coriaceous texture than the rest of the plant, smooth, and of a light cinereous colour.

The whole plant gives out at night a bright phosphorescent light, somewhat similar to that emitted by the larger fire-flies, having a pale greenish hue. From this circumstance, and from growing on a palm, it is called by the inhabitants "*Flor de Coco.*"

Villa de Natividade, Province of Goyaz,
Brazil, *December 13th*, 1839.

Upon the subject of the above Mr Berkeley has kindly communicated to me the following letter:—

"My Dear Sir,—I have read with great interest Mr Gardner's communication. The phenomenon, however, observed by him is not entirely new. *Agaricus olearius*, Dec.,*

* Fries thinks it probable, that the luminous appearance is due to the presence of a *Cladosporium*, but as other Agarics are luminous, the opinion seems to be unfounded.

exhibits it in a very striking degree, and a similar phosphorescence was noticed by Rumphius in a species of the same genus in Amboyna, and it is probable that other species possess the same property. Indeed, Fries seems to assert as much in his "*Epicrisis*." The luminous appearance exhibited by certain *Rhizomorphæ*, which are in general anomalous forms of Fungi, has been frequently described. Mr Gardner's plant however is doubtless quite new, and is probably referrible to Fries' new genus *Panus*, which associates those *Agarics* of the tribe *Pleurotus* which are of a more persistent and coriaceous substance, as *A. conchatus*, &c. The specific appellation proposed by Mr Gardner is certainly not preoccupied; but as the property of phosphorescence is not peculiar to his plant, I should prefer denoting it by the name of its zealous discoverer. At present I have seen no specimens, but there appears no reason to doubt, though it has the habit of a *Cantharellus*, that he has referred it to its right place in the Mycologic system. It is to be regretted that he did not ascertain the colour of the sporidia, a point of such great importance in the vast genus *Agaricus*, and its allies. I am, My Dear Sir, with much respect,

Faithfully yours,

M. J. BERKELEY.

To Sir W. J. Hooker.

KING'S CLIFF, *August* 4, 1840.

When the specimens arrive, we shall take the opportunity, with the assistance of the drawing made on the spot by Mr Gardner, of giving a figure of this interesting Agaric.

XXVII.—*On the Structure and Functions of the* POLLEN. By JOHN ALDRIDGE, Esq.

[WE feel gratified in affording an early place in our Journal to the following observations on that very obscure but interesting subject, vegetable impregnation, which have been communicated in a letter by a gentleman, who, we trust, will continue his researches, which cannot fail to throw a new light on this department of vegetable physiology. We have received

from the same individual a more elaborate paper, with numerous drawings, which it is intended should be read before the Members of the British Association, meeting in Glasgow.—Ed.]

Mount-Michael, Glasnevin,
Dublin, *August* 6*th*, 1840.

My Dear Sir,—In the character of a former pupil of yours, I take the liberty of communicating to you some observations which I have made upon the structure and functions of the pollen, and which, I believe to be original.

You are of course aware, that acids possess the property of causing the grains of pollen to dehisce. This discovery, mentioned with regard to the sulphuric acid, in Lindley's last edition of his "*Introduction*," I had previously found to occur with dilute nitric acid, and I have since extended the observation to most of the acids, as well organic as inorganic.

The knowledge of this fact would appear naturally to lead to the chemical examination of the stigma, and accordingly I have found the stigma to be acid at some period. This curious fact is easily demonstrated by pressing any stigma, especially a large fleshy one, such as that of the *Turk's cap Lily*, or a *Grevillea*, between a fold of litmus paper. Your extensive acquaintance with species will suggest an infinite number of corroborative phenomena; thus, in *Myosotis*, some species of *Symphytum*, *Borago*, *Anchusa*, *Polemonium*, etc., you may recollect the flowers being red before impregnation, and changing to blue afterwards; while in some species of *Iris*, the converse of this is found, for the petaloid stigmas, which are blue previous to the bursting of the anthers, immediately afterwards become purple. In these cases, the natural colouring matter supplies an appropriate test for the existence of acid.

I need but call to your recollection the differences which have existed between the observations of Brongniart and Treviranus, as respects the mode of dehiscence of the pollen; the first perceiving the protrusion of a gut or tube, which he imagined to descend through the intercellular passages of the stigma; while the latter was never able to detect this organ. Lindley reconciles this contradiction by the difference of the

circumstances under which dehiscence may take place:—in water no gut being protruded, but the fovilla scattering itself irregularly through the liquid; while on the stigma, the tube is formed in consequence of what he conceives to be a vital action.

I find that under the influence of acids, the contents of the pollen are protruded in *many instances* in a form closely resembling a gut or tube, but that in pure water, when rupture takes place, the fovilla diffuses itself through the fluid without any order.

My next observation explains how this happens; for I find in the transparent pollen of *Monocotyledones*, as well as of the *Rosaceæ*, *Leguminosæ*, &c., the addition of acid renders them instantly opaque; and I am thus led to conclude that the fluid in which the fovilla floats, is coagulated by these reagents. Now, when the external membrane of the pollen dehisces by pores, it is easy to understand why the coagulated contents, forced through these small round apertures, should assume a tubular or gut-like appearance. In the *Liliaceæ*, *Smilaceæ*, *Butomeæ*, and several allied families, the dehiscence is by a suture; and in those cases, upon the addition of acid, the external membrane peels off, leaving the contents of the original form: while I have sometimes found species, such as *Butomus umbellatus*, and *Iris fœtidissima*, which have naturally opaque pollen, burst in water in a manner similar to their allies under the influence of acid, and I have always found these varieties capable of reddening litmus.

An appearance which might seem to support Brongniart's hypothesis, is frequently seen in *Gentianeæ*, *Tropeoleæ*, *Lineæ*, *Plumbagineæ*, *Polemoniaceæ*, *Labiatæ*, and some other families. The pollen of these plants when placed in water or acid, may be observed to form on their surfaces little vesicles, which are at first transparent, but become in acid soon opaque. These vesicles are evidently formed by the protrusion of an inner membrane of the pollen, through pores in an outer one; but when they burst, the usual results take place; if in water, the fovilla becomes scattered, if in acid, it is bounded by a definite gelatine.

Many observers have remarked the alterations which the form of the pollen frequently undergoes when placed in water. I find that the addition of acid often produces a fresh metamorphose. Thus, in the *Leguminosæ*, *Rosaceæ*, *Crassulaceæ*, *Saxifrageæ*, *Hippocastaneæ*, *Rutaceæ*, and those genera of *Ranunculaceæ* which have follicular fruits, the pollen when dry is oval, and marked with a dark central line, but when placed in water, the central line disappears, and the figure rapidly becomes spheroid; again, when acid is added previous to protruding its contents, it usually assumes a triangular appearance. Now, it is very curious to find in *Grevillea*, the pollen naturally to possess a triangular form, exactly similar to what acids produce in the former instances at the same time. This is beautifully explained in the structure of the flower in this genus; for the green stigma is very acid, and when the flower is young is pressed strongly against the anthers. The pollen being thus developed under acid influence, possesses normally the same form, as is produced in other cases artificially.

The triangular pollen of *Onagrariæ* and *Circeæ*, is not to be confounded with that of *Grevillea*, being produced by a very different cause. In the families cited, the triangular form of the pollen is produced by the cohesion of three spindle-shaped granules, which can be very distinctly seen in *Epilobium hirsutum*. In this species, each granule which enters into this compound pollen, is capable, under the influence of acid, of dehiscing by a pore at each extremity, so that the pollen bursts by six pores. In *Fuchsia*, *Œnothera*, and *Circæa*, the neighbouring pores coalesce, so that in these cases the pollen bursts by three pores only.

A phenomenon, similar to that of *Grevillea*, is presented in *Fumaria*; in this instance the diadelphous stamens have their anthers collected between the extremity of the stigma and the connate and highly acid summits of the inner petals. Under these circumstances, the natural form of the pollen in *Fumaria* is the same as may be produced through the agency of acids in *Corydalis* and *Dielytra*.

The above are the most general and best proved of my observations, which may be shortly stated thus: namely, that the stigma is always acid; that it is in consequence of this acidity that the pollen bursts: that by the same means the fluid contents become coagulated, enveloping the fovilla, and assuming, according to the method of dehiscence, different and very remarkable forms.

I am aware that these observations render still more obscure the operations of the pollen on the ovule. It is difficult to conceive how the fovilla entangled in a coagulated mass, can reach the ovule. But we must be contented to take truth as we find it. It is the object of the natural historian to observe, rather than explain.

If you think the foregoing phenomena worthy of your attention, I can supply you with a copy of the diagrams which I have drawn from the examination of numerous species, belonging to many families. The operations of the laws which I have just described, seem to me to be fraught with phenomena of great interest in detail, and perhaps upon examination, you may consider the subject worthy of being brought before the British Association.

Apologising for intruding upon time so valuable as yours, I have the honour to remain,

My Dear Sir,

Your obliged Pupil,

JOHN ALDRIDGE.

XXVIII.—BOTANICAL INFORMATION.

[Again we have had the pleasure of receiving intelligence from Mr Gardner. The following are extracts from his correspondence.]

VILLA DE NATIVIDADE, PROVINCE OF GOYAZ,
BRAZIL, *January 6th*, 1840.

"ABOUT two months ago, I wrote pretty fully, giving a sketch of my journey from the city of Oeiras to this place; and although I have not much that is important to commu-

nicate since that period, the opportunity now afforded by the heavy rains that deluge the country inclines me thus to employ the interval of leisure. My only fear is lest I should trouble you with too many letters; but as it will be impossible to write again for two months, you will probably pardon me on the present occasion. Enclosed, you will find two little papers which I have drawn up for you; one on the structure of the genus *Crescentia*, and another containing a description of a beautiful phosphorescent species of *Agaric*. In the former is an accurate description of a *Crescentia*, which appears hitherto unknown, and whose peculiarities induced me to make a few observations on the affinities of the genus; but it remains with you to decide if these remarks be worth the publishing. Of the *Agaric*, I have made a very rough drawing, conveying, however, a tolerable idea of its appearance; it is very possible that some of the Botanists who have lately visited the interior of Brazil, may have already collected this *Fungus*. I have procured a number of specimens of it, and they have dried pretty well, considering the dampness of the season. From Crato, I sent you a description of a Tree, which I have called *Erionema;* I have no doubt it will belong to the Nat. Order *Styraceæ*, and would have so referred it when drawing up the character, but that I observed, in the definition of *Styraceæ*, as given by Lindley, that the æstivation is imbricated, while in my plant it is distinctly valvate. This structure, together with its being polypetalous, and having an inferior fruit, decided me at one time to refer my *Erionema* to the neighbourhood of *Loranthaceæ*. I have since found a species of *Strigilia*, which seems to be a legitimate genus of *Styraceæ*, and has a valvate æstivation, and this has led me to suspect that my plant also belongs to the same Order. You will, of course, be able to ascertain this point at once; but to whatever Order it shall be referred, I think there can be no doubt of its bearing a strong affinity to those with which I have compared it.

"Since I wrote to you last, the weather has been extremely wet; to-day completes the number of thirty days, during

which it has rained heavily; and you may hence judge that it has been impossible for me to make any important excursions in this neighbourhood. I, however, embrace every opportunity that offers for going out, and by this means have added considerably to my stock of dried specimens. In my last letter, I believe I stated that I had eight hundred species; the number now amounts, I am sure, to full a thousand, and the specimens to upwards of twenty thousand. Among some of the rarities lately added to my stock, I may mention a fine species of *Tapura*, (Aubl.); a *Diplusodon*, with large purple flowers; and a small tree which I believe to be the *Physocalymna florida* (Pohl), but the specimens are in a very bad condition, having neither flower nor fruit, the large calyx being all that remains. It is very common in this neighbourhood, the inflorescence, however, only appearing during the dry season. I also found a beautiful annual *Gloxinia*, about a foot and a half high, with purple axillary blossoms, the middle lobe of the under lip of which has its margin toothed and turned inwards, so as exactly to resemble the lower jaw of a fish, from which peculiarity I have named the species *G. icthyostoma*. Along with it grows another individual of the same genus, somewhat similar to the one which I sent you from Oeiras, and an herbaceous fibrous-rooted *Gesneria*, which is not yet in flower; I hope soon to procure specimens of both. They grow in the shady clefts of calcareous rocks, inhabited also by a climbing species of *Alstrœmeria*, which will soon be in blossom. Two species of *Ilex*, one of them perhaps but a narrow-leaved variety of the other, numerous *Compositæ*, and *Melastomaceæ*, and a few terrestrial *Orchideæ*, have lately rewarded my researches. One of the latter is highly beautiful; as yet I have obtained but two specimens of it, but more are coming into blossom. It is about two and a half feet high, with numerous lanceolate, somewhat amplexicaul glaucous leaves, from the base of the uppermost of which is produced the flower, about three inches long, and of a purplish colour. The structure of the inflorescence resembles the genus *Vanilla*, to which the plant

may belong. At each side of the base of the column, there are two whitish glandular bodies, about the size of large peas: do these exist in *Vanilla?* This *Orchideous plant* would prove a great ornament to the hothouses of Britain, and I shall accordingly do my best to preserve alive some of its fleshy tuberous roots, till I can obtain the opportunity of sending them home. Several *Ferns* also occurred, among which are four species of *Anemia*, one of them a beautiful little plant, found, though very rarely, on the top of a high Serra near this Villa; it has multipartite leaves. On the shady faces of calcareous rocks, grows a very pretty small *Adiantum*. Of *Mosses*, I have only met with one species in fruit, a *Weissia*, probably *W. curvirostra* (Hook.) Two *Vel-loziæ* are abundant here, but neither of them is yet in flower; indeed I have been unfortunate with this genus, having seen no fewer than six species of it since I left Crato, not one of them in a flowering state. Perhaps they may occur in my way to Minas. The rains will probably forbid my leaving the province of Goyaz, till the end of March; but by that time I expect to be on the Serra which divides it from Minas Geraes, where I hope to find a good field for my labours. The route I shall probably follow is this. From Goyaz I intend to gain San Romao, on the Rio San Francisco; then, crossing the river, proceed up to Tejuca, and Villa do Principe in the Diamond district. From thence I go to Sabará, Gongosoca, Villa Rica, and San Joao del Rey, and thence again, *via* Barbacena and the Organ Mountains, I hope to gain Rio de Janeiro. I shall be unable to transmit any specimens home, till I reach the latter place, and by that time I expect to have more than doubled my present stock. The journey is attended with considerable expense. I have now ten horses, and will soon require to get more. Yours, &c.,

"G. GARDNER."

"P. S. I hope you spent a merrier Christmas than I did. Let alone feasting, we have enough to do to procure the necessaries of life."

Figures des CACTÉES *en fleur, peintés et Lithographiées d' après nature, avec un texte explicatif; par* M. LOUIS PFEIFFER, Docteur en Médecine, et M. FR. OTTO, Directeur du Jardin au Roi à Berlin.

OF this work, the respectability of which is guaranteed by the names attached to it, the three first Fasciculi are now before us. It is published in 4to, each number having five plates, partially coloured, and as many leaves of letter-press; the descriptions are written both in French and German; the specific character always in Latin. Though not in the first style of the art, the plates seem to be executed with great accuracy, and the subjects are selected from the rich gardens of Berlin, Munich, Dyck, Erfurt, and Cassel. No. 1. exhibits *Echinocactus Sellowianus*, *E. centaterius*, (Lehm.), *Mammillaria bicolor*, Lehm., *Echinopsis* (a genus made by Zuccarini to include the *Cerei globosi* of authors) *multiplex*. *Cereus Hookeri* Link. et Otto. (*Epiphyllum*, Haw.). *Opuntia Salmiana*, Parm; and *O. Curassavica*, Mill.—No. 2. *Mammillaria cirrhifera*, Mart. *M. Seitziana*, Mart. *Echinocactus phyllacanthus*, Mart. *Cereus Phyllanthus*, De Cand.; and *C. latifrons*, Zucc.—No. 3. *Cereus Curtisii*, Link. et Otto. (*Cactus Royeni*, Hook. Bot. Mag.) *Cereus flagriformis*, Zucc. *Mammillaria uberiformis*, Zucc. *Echinocactus leucacanthus*, Zucc.; and *Cereus coccineus*, Salm.

We are happy to be able to announce, that the "*Plantæ Hartwegianæ*" of Mr Bentham, which we noticed as printed by the author for private circulation, may now be had as a published work, of Mr William Pamplin, 9, Queen Street, Soho, London. The price of the first part is 2s. 6d.

The 2d Part (or Pentas) of Mr Webb's "*Otia Hispanica*," has recently appeared at Paris, and contains a beau-

tiful coloured plate of five *Algæ;* viz., *Griffithsia flabellata*, Mont., *Gigartina Gaditana*, Mont., *Delesseria interrupta*, Ag., *Gigartina conferta*, Schousb., and *Griffithsia Schousboei*, Mont. The descriptions are from the pen of Dr Montaigne, the distinguished Agamist of Paris.

It is gratifying to be able to say, that the 6th and last part of Professor Lindley's "*Genera et Species Orchidearum*," is rapidly advancing, and will contain the *Neottideæ*. This is a work of inestimable value, and will be the more prized, now that the extensive family of which it treats is so generally cultivated and so much studied.

From Madras, we have received the continuation of Dr Wight's two publications on the Botany of India, which now extend, the "*Illustrations of Indian Botany*," to the end of the first volume; and "*Icones Plantarum Indiæ Orientalis*," to the 14th *Fasciculus*.

We have much pleasure in announcing, that the Society for the extinction of Slavery in Africa, and for the Civilization of the Africans, has expressed a wish that a Botanist should accompany their projected expedition up the Niger. A competent person has been already recommended, and should he be approved of by the Society, it is confidently hoped that our knowledge of the Botany of Western Africa will be considerably promoted, and that many valuable and hitherto unknown plants will, by his means, be introduced to our herbaria.

Another station has lately been discovered for that highly curious and rare Moss, *Buxbaumia aphylla*, by Mr George Lyon of Glasgow, upon a bleak knoll, on hills of considerable elevation at Bowling, on the banks of the Clyde, about twelve miles below Glasgow. The locality of this Moss is very remarkable. On the Continent of Europe, and in North America, we believe its habitat is generally the old decayed trunks of trees. In England, it was first discovered thirty-five years ago, on the ground, in a young fir-plantation near Norwich. The second station was near Aberdeen; the third in a wood, but on the bare ground, at Rosslyn; the fourth on a moor in Peebles-shire; the fifth, on a very exposed spot near the summit of one of the Lomond hills in Fifeshire; and lastly, in the place above mentioned in Dumbartonshire. In all these localities the plant has generally been found very sparingly, and has soon disappeared.

Twenty sets of the late Mr Drummond's unpublished "*Mosses and Hepaticæ of Louisiana*," named and arranged by Messrs Wilson and Hooker, are nearly ready for sale, and may shortly be had by application to Wm. Wilson, Esq., of Bruch Cottage, Warrington; to the Editor of this Journal; or to Mr William Pamplin, 9, Queen Street, Soho Square. Each set consists of about 200 species, in beautiful condition, and will be offered, as already announced in the "*Annals of Nat. History*," at the rate of £2 the 100 species.

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